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# FRAGMENTS

IN

# PHILOSOPHY AND SCIENCE

# FRAGMENTS

IN

# PHILOSOPHY AND SCIENCE

BEING

## COLLECTED ESSAYS AND ADDRESSES

BY

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TO MY WIFE

Helen Green Baldwin

WHOSE SYMPATHY AND HELP HAVE BEEN UNFAILING DURING ALL
THE YEARS AND IN ALL THE INTERESTS OF MY
PURSUIT OF PHILOSOPHY AND SCIENCE

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# PREFATORY NOTE

THE volume is made up of papers selected from a larger number scattered during fifteen years in various journals. It is thought worth while to gather them together because — and the selections are made with view to this — they are related to larger topics on which I have published more extensively — or intend to — in separate works. The group of philosophical essays are introductory to a developed view of the world. The critical and historical papers naturally stand more squarely on their own feet; yet they too walk in a direction, and carry their own signboards. The strictly experimental studies, on the other hand, give results which in so far justify their own presence here either as contributing something to their respective topics, or as announcing ideas which have proved in some small way fruitful in the later literature.

Speaking of signboards, it may be well to erect one or two of them in this place, in advance, though I know the risks of labelling things, and tremble before that risk. Yet one may be allowed to encourage his reader to start in — or to discourage him from starting in! — by telling him what the general direction is. At any rate so much is in my mind to say, not only for readers of these papers, but for those who may know the more connected discussions of my other books.

First, the philosophical presupposition of a view which joins the words "Philosophy" and "Science" is, to my thinking, at once an Idealism and also a Naturalism. No philosophy can to-day deny Naturalism; by Naturalism meaning the recognition of the right of Dame Nature, — physical, vital, mental, — to be and to do what she really *is* and *does* with no let nor hindrance whatever, from us or from all the tribe of thought.

If we allow science at all — knowledge of Nature, at all — then the ideal of science and of scientific explanation is once for all erected. The camel's body will follow his nose! Philosophy at the best must saddle the camel — not hack him to pieces, nor essay to build a more comely beast from such of his *disjecta membra* as suit a finished taste! Naturalism, which, in my usage of the term, is a name for science not for philosophy, must sweep the boards of every fact that "is, was, or ever shall be," of every fact of every kind, before its task is done, leaving not a pawn on any square of the board we call the cosmos.

Second, Philosophy is a new reading of Science, a saying of this or that about knowledge — not a special species of knowledge, nor a discovery of what is new. Philosophy evaluates, estimates, criticises, unifies, enjoys. Philosophy says "How?" — to Science's "What?" How can this and that both be true? — how can the universe hold both man and nature? — both fact and ideal? — both "is" and "ought"? How can action be immoral and thinking false? — the world so beautiful and its second ring so hollow! In short: How can and how must we men think Nature and act naturally? — Nature being what and only what science makes her out to be.

If such be one's presuppositions, then it follows that one's philosophy is simply one's thought — one's best thought — about Nature.

Now another signboard — a personal signboard! My best thought of nature, my type of philosophy, is an Idealism which finds that the universe of science, is, when all is said, a cosmos which is not only true but also beautiful, and in some sense good. Science tells us what is true; that is science's prerogative: and whatever may be science's final word about Nature, that word is in so far the truth of the matter. Philosophy then enters her questions: How can such truth be also good, beautiful, livable — or none of these? While others say other things, and many others many other things, I say — using the liberty of this preface — it is true and good *because it is beautiful.* Nothing, I think, can be true without being beautiful, and nothing can be, in any high sense, good without being beautiful. In the words of my colleague and friend Professor A. T. Ormond (*Foundations of Knowledge*, p. 228) "the æsthetic principle is at the same time a demand and an intuition . . . . an ideal requirement and an intuition under which our world completes itself. . . . It represents the point in our conceptions where worth and truth coalesce and become one."

The ascription of beauty, a reasoned, criticised, thought-out ascription of æsthetic quality, is the final form of our thought about nature, man, the world, the All. Let this be our sign-board — vague-seeming as it is!

J. M. B.

PRINCETON, *March*, 1902.

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# FRAGMENTS IN PHILOSOPHY AND SCIENCE

# I

## PHILOSOPHY: ITS RELATION TO LIFE AND EDUCATION[1]

"One seems to hear three conflicting voices throughout the centuries. The response made by one of these is: '*I can see nothing;*' adding, with monstrous inconsistency: '*I have faith all the same in the inductions of physical science.*' A contrary utterance comes from another voice: '*I can see the universe through and through.*' These two voices are apt to overbear the third: '*I see enough,*' it proclaims, '*to justify the faith that I am living in a universe in which the natural is subordinate to, yet in harmony with, the moral and spiritual order and purpose which my higher being requires; and I also find that the more I cultivate this faith by philosophical reflection, the better I can see the little that can be conquered by practical reason, and the more wisely I can shape my life.*'" — PROFESSOR FRASER.

THE popular estimate of philosophy is generally unfavorable. Popularly philosophy, metaphysics, is considered the domain of speculation and theory, the subject most removed from human life, the philosopher's excuse, perhaps, for the neglect of the social and political duties of common men. While philosophers, in their lives and acts, may give countenance to this view, philosophy abjures it; and she abjures it both in the name of the task she seeks to perform and of the tasks she has performed in the world. Philosophy has been the soul of the world's great movements in history, in politics, in art, in religion; wherever an affair of human interest has gone deep enough to give

[1] Inaugural address delivered at the University of Toronto in 1890. Reprinted from *The Presbyterian and Reformed Review*, January, 1894.

color to a nation's development, hindrance to human wrongs, or vigor to the higher aspiration of a people — there, therein, has been philosophy.

The fallacious popular estimate of philosophy is easily explained; it is fallacious because it is the popular estimate. Philosophy has for a mission a task which the majority of men take for granted, at the same time that they decry it and its pursuers. Men act on the supposition that the world is reasonable, that knowledge is true, that duty is right, that human affections and expectations are not a mirage of desert hopes, that nature has satisfactions for her own cravings, and that every phase of human emotion has an answering response somewhere; but how many of us can justify these beliefs from our experience? Who of us will endeavor to explain the most legitimate and commonplace affairs of life? When one attempts this he becomes a philosopher. He undertakes a task in which all men are interested. And yet when it takes to itself a name and proposes for itself a programme, this attempt is one in which most men take no interest.

There is an important sense, however, in which the popular opinion of philosophy is true. The nature of the subject with which it deals; the more or less conjectural hypotheses which may be put forth with dogmatic assurance and confidence and some show of reason — hypotheses which often rest upon individual prejudice or misconception, or exhibit ignorance of established fact; the traditional belief that no philosophy is true which does not explain the infinite and eternal, however it may neglect the concrete and empirical; the audacity with which the metaphysician sometimes explodes his guns over the heads but beneath the regard of the plodding and successful worker in science — all these

things have tended to bring speculation into disrepute, and to make metaphysics synonymous with fancy. In the language of Clifford, "the word philosopher has come to mean the man who thinks it his business to explain everything in a certain number of large books."

It is against this abuse of philosophy that I wish on this occasion especially to protest; not against the criticism which is aimed at the extravagance of speculation. But in so far as philosophy in its true province and as concerned with its true problem is involved in this criticism, such aspersions are unjust, and they should be vigorously met — met on the ground of the popular considerations which are urged by the detractors of metaphysical study.

With a view to such a popular presentation of the claims of philosophy, the problems which it undertakes to solve may engage our attention at the outset, and my first proposition is this: *That philosophical problems are problems of human life.*

For example, what philosophical students call the world-problem: whence the world, what the world, why the world, whither the world? One philosopher answers: Whence the world? It is eternal. What the world? It is matter and mechanism. Why the world? It has no end nor purpose. Whither the world? To extinction or back to eternity. And we ask how the reply of the materialist bears upon human life. He answers: Man is part of the world, man results from matter and mechanism, man is without purpose and without destiny. He eats, he drinks, to-morrow he dies; nature and natural satisfactions are the only good: self-sacrifice, generosity, love, have no meaning beyond

gratification; happiness is my legitimate end, and happiness alone is worthy of my striving.

Now this doctrine is philosophical, and many a man believes it who does not live it out; while many another lives it out without formulating it. Convince a man that the mind is a function of the brain, that emotion is the discharge, the equilibrium, the interplay of nervous forces; that the will is no more than complex feelings of innervation or inhibition; and he must think more in reference to his physical personality and its impulses and satisfactions than of the pursuit of ideal things for which his theory gives him no justification. His conduct must have reference, tacitly at least, to the sphere of this particular kind of reality — to the principle in which he believes the order of things is ultimately grounded — and his altruistic part must live more or less under protest, or by inconsistent tolerance.

Another philosopher says: What the world? I do not know. Whence, why, whither the world? I do not know. I am ignorant of all explanation of the constitution, origin, and destiny of things, and what is more to the point, I flatter myself that I do not care. What bearing has this on human life? This: — that the denial and neglect of problems does not banish them. If a man have any intellectual part, any sense of meaning in the events, or even in the dead matter, of creation, he must realize the inevitable interrogation marks which confront him, turn where he will. What is birth, life, death? What is the state? What is capital, labor, civilization? His whole environment presses in upon him like so many goads prodding him on to inquiry. To say 'I do not know' is to deny himself the stature of manhood, the vigor of developed intelligence, to suppress

the faculties of invention and imaginative construction, to put his hand to his own throat and choke off the potencies within him. Where were nature-discovery, labor-saving devices, practical conveniences and comforts, to say nothing of ideal things, if an Agnostic theory of the world were kept consistently to the fore?

Still another says: What the world? An idea, a dream. Whence the world? From my thought. Why the world? To condition my thought. Whither the world? Back to the place of ideal forms — where the subjective idealist loves to lose himself in contemplation. What effect has this on life? This: — it leads away from the material, the mechanical, the definite, to the vague, the shadowy, the unreal. Stern conditions are removed in thought, not in fact. Hard surroundings are scorned, not overcome. Humanity is neglected, not relieved. The subjective Idealist builds his own world and lives in it, the happiest of men but not the most useful. Incentive to action, the sting of stern inflexible reality does not penetrate his armor, and too often he lifts no effective arm to advance the commonplace utilities of life.

Again, consider the problem of knowledge. Is there such a thing as knowledge? If so, of what? Of an external world, of self, of God? What is truth?

Answer this with the Positivist who admits no knowledge but of the external world, to whom consciousness has no legitimate voice, to whom the inner world is an illusion, and then take stock of human life. It is then measured in terms of the yard and pound — it is of value as it is brought into relation to the profits and losses of trade or the utilities of material acquisition. Physical science receives all merited attention, discovery in nature transforms society; but the æsthetic,

the poetic, and the human in any true sense, die out. American civilization is in some of its aspects at once an example and a warning of Positivism in individual and national life.

Answer this question with the philosophical Sceptic, the pure experientialist to whom all that we call knowledge is a fleeting play of mental states, a panorama of subjective pictures with no reality either in the world or in mind — and estimate again the value of life. The material now vanishes with the ideal, positive science, conscious incentives, wealth, distinction, glory, fade from pursuit, for the material is a phantom show as mind and its utterances are. And what is left? Ask Helvetius, Diderot and La Mettrie. They answer for us: sensations, gleams of pleasure, atoms of living. Nihilism is its developed doctrine and anarchism its logical attitude toward all restriction and order.

But the affirmative answer to the question, "Can we find truth?" brings back the worth of living. If our natural knowledge is true, then science is possible, discovery and invention are leading us on to the ultimate revelation of nature's secret things; if the mind works true, then its intimations of spiritual reality, of emotional satisfactions, of self-realization by self-control and choice of the best are worth while and so are its assurances of a goal, a destiny.

Note further, the bearing of the answer of this question upon society and its institutions. Society is a structure based upon rights, rights waived and rights secured, mutually understood and respected. Let the restraints be removed from within, the authority of the voice which teaches me altruism and reciprocity of obligation and duty, and I become an enemy to society, an iconoclast, an anarchist, a political libertine. If morality

is custom, why may I not deviate from custom? Who made custom my master? If government is a compact, who may say that I am a party to the compact; and, if unwilling, by what authority can I be compelled? If law is convention, and convention is convenience, why not my convenience? A doctrine which runs to the brink of the French revolution — of the social disintegration due to Individualism in philosophy.

We are thus led to see that the problems which the philosophic spirit sets itself are not different from the ordinary questions of our lives. We judge men every day by their philosophy; their views on just those questions which philosophers discuss. My second proposition, accordingly, is this: *That its effects on life are, in a general way, and when historically interpreted, a legitimate test of the truth or falsity of a philosophical doctrine or system.*

This position is often denied. We are told we must love truth for truth's sake, and leave the consequences to themselves; that the inquirer, the philosopher, cannot be responsible for consequences. This is sometimes true; yet it is surprising in how few cases it is true. *It is never true in philosophy.* From the nature of the case, consequences enter as a part of the material of the philosophic construction — consequences in experience and life. Philosophy puts the question: How can I explain man and his environment? It is only half a solution to explain either man or his environment. Materialism explains man in terms of the environment, subjective idealism explains the environment in terms of man; but no philosophy is true which leaves out of its reckoning any degree on the arc which measures the mutual relation between personality and nature.

Life is, therefore — to go a little deeper — the sphere of the interaction of man and nature, the sphere of experience, the only storehouse of data from a philosophic solution. And all aspects of experience must have equal weight. It is the habit of natural science to magnify law, to deify universality, to disparage individuality, to ridicule heart; this is the environment aspect of the question. The metaphysician and moralist is prone to magnify individuality, to deny law, to disparage the external; this is the personality aspect. The rights of each must be fully recognized; yet the latter is and should be popularly emphasized in this generation for several reasons.

In the first place, because the limitation of philosophical data to experience carries the presumption that nature is always a party to experience, that that only is experience which consists in a reaction of man on nature. That this is a false presumption is seen in the larger half of human experience. The overwhelming testimony of life is that its greater part both has no material reference and is incapable of such a reference. The entire range of higher emotion points to needs which life never fully realizes, and by realizing, only enhances. The postulates of our ethical selves, which untutored intelligence spontaneously and daily reckons the most important, durable, and true of all our experiences, not only run above natural reactions, but often seem to run counter to them. The tendency of natural science is to the refusal to the heart of all share in the determination of truth, the denial to the will of any validity in its requirement of a principle of regulation more inflexible for man than the principles of nature. Man may deny and violate natural law, bidding defiance to its material compulsion, and preserve that wholeness of inner

truth which constitutes his integrity as man; but who can escape the commandments of his own inner nature, the law of self-realization which tells him: "What thou art thou shalt act out, and wherein thou violatest the right thou thyself shalt suffer loss"?

But these inner truths should be further emphasized for their own sake; it is strange that they should ever need emphasis. Why, if all facts are sacred and none are intentionally outraged, why should not facts of mind be as valid as facts of nature? Why should not all facts of mind be as valid as any facts of nature? Why is the emotional recoil which all men feel in the presence of cruelty not as good evidence that cruelty is contrary to the order of biological development as is found in the bleeding tissue which is left by a cruel blow? Why is not the degenerate will which follows an egoistic theory of conduct as valid evidence that self-control is nature's higher law as are the physical effects which follow conduct on this theory? It is as valid evidence, though in the former case we appeal to consequences, and in the latter case to law. But the former is law as much as is the latter. Biological evolution is based upon a principle whereby needs arise where satisfactions are, and where satisfactions are not found, there no need is; the economist develops the social organism on the same principle, that supply does not precede but always accompanies demand. Yet what treatment does the man receive at the hands of contemporary science who claims that an ethical demand is sufficient proof of its own normal satisfaction, and that mental intimations of immortality afford presumptive evidence of a future life? Yet the man of science knows that such inner experiences are facts, that they are experiences, and, in the face of such knowledge, sweeps them

away as sentiment or illusion, and exhorts the man who is as good a scientist and a better philosopher than himself, by reason of a more comprehensive theory of experience, to curb his imagination, and cease to trouble himself about consequences!

But the natural sciences demand a further philosophy than is afforded by the simple postulate of experience; for the possibility of experience, of a relation at all between man and nature, must have its philosophy. To go no deeper into the question, "How is experience possible?" than the strict empiricist would follow, it occurs to me to ask by what right he uses experience at all; by what right his categories or types serve him for the generalization of possible experience; by what right he constructs hypotheses which go beyond experience. I ask him why he exercises faith in his investigations of nature, why he ever trusts his facts out of his sight — by what right, in the name of all that is empirical, he ventures to prophesy in regard to nature. His whole procedure in these respects — which are fundamentally one — is in so far a refutation of a philosophy which recognizes no values or meanings except those which experience appears to justify.

We find accordingly that both the facts of personality and the facts of environment must be recast in a deeper metaphysic of experience itself. This problem underlies all the empirical work, both of the naturalist and of the philosopher, and they are equally dependent on its verdict. But in this more abstruse discussion, the mental claims a certain priority and nature-science must be content with second place. The physical investigator, therefore, who so loudly declaims against metaphysics and presses it to a preliminary self-defence, in its recognition of anything not subject to gravitation and cohesion,

is only insisting on a procedure which must result in a curtailment of his own claims; either in the way of an admission of lack of certainty in his results, or in the way of the recognition of other grounds of assurance than those afforded by the atomistic and fragmentary results of experience. There are those who are modest enough to take the first of these alternatives, and there are also those who are philosophical enough to take the second.

We are led, therefore, both from a superficial view of experience and by a more critical philosophical method, to the view that a system of thought may be legitimately judged by its effects on life and character. But the further question at once arises: How are these results to be estimated? How am I to say what elements of character are due to a man's philosophical opinions, and how far is he moulded by the current doctrines of his generation? These are legitimate questions, and their proper answer greatly narrows the range of the thesis we are considering in two distinct particulars, one of which is a caution taught us by the student of science, and the other of which we draw from the domain of historical study.

For we may say — and this is where we must love truth for truth's sake and take no account of consequences — that facts, established truths, are never to be disregarded nor denied in view of their results. Facts are sacred, lead where they will. Do they interfere with our views of life? Then our views of life are wrong. Do they conflict with authority? Then authority must go, be it authority customarily considered even more sacred. I would be the last to hamper investigation with a shrinking timidity of consequences. It is the main merit of

the new movements in philosophy that they are throwing authority to the winds and letting facts stand for themselves. But this is science, this treatment of isolated facts. Philosophy goes further in asking: How can I interpret these and other facts in a consistent theory? Note carefully — not these facts only, but these and other facts. All facts are equal before law. Our theory must neglect none of them. Do they conflict with one another? Then my philosophy is not true, and it is quite possible that I am unable to construct a theory in the particular case that is true. A large number of philosophical questions to-day are in this stage waiting for further results from science, and on these questions philosophers should confess ignorance; a modesty which is growing among us, and which is in striking contrast with the extravagant omniscience of some systems of metaphysics.

Now, by consequences in life, I mean actual facts of my life — inner truths which are sacred, as facts. These we must preserve most loyally. But our cherished interpretations of them, our theories of living, these are no more than any hypotheses which serve their day and aid us to live until further truth teaches us to throw them aside, or reconstruct them with due reference to our new acquisitions. As far as disregard for consequences has reference to interpretations, it is just; but when it includes fundamental mental experiences, those truths which go to make up our intellectual and moral integrity, it is wrong. It is in the latter interest, unfortunately, that the criticism of philosophy is usually made; and it is sometimes in the former interest, unfortunately too, that the consequential argument is appealed to by speculative thinkers.

Again, the bearings of a philosophy on life can only

be discovered in a broad historical survey; certainly not by a judgment of individual men. In individual cases it is the character that influences the philosophy as often as the reverse. Yet the history of philosophy studied by epochs and in periods of decided philosophical tendency, indicates results in morals, institutions, general life, which are unmistakable. We need no special historical research to inform us that Idealism inspired the mind in the blooming period of Greek art; that Stoicism dominated the martial period of Roman greatness; and that Materialism has ruled in the history of French democracy. Whichever be cause and whichever be effect, philosophy and character, thought and life, can never be divorced.

In view of the foregoing, a third position of general interest may be taken: *That instruction in philosophy is an essential element in sound academic culture, and that to accomplish his true work in education the instructor in philosophy must be alive to the essential conditions of progress in each of several great departments of learning.*

The remarks already made to signalize the limitations of empirical science and its dependence on speculative theory indicate, in part, the relation of scientific study to philosophy in the course of university instruction. It is the boast of science that she stoops to small things, to the gathering and preserving of humble details, that she is ready to sacrifice the "lordly theory" to the "paltry fact," and it is a part of this pride that she should resent and expose the study which too often proceeds in ignorant and arrogant neglect of the truths which she has established by patient and exhaustive toil. The opposition of science, so far as it is reasonable, is not an oppo-

sition to philosophy, but to the vagaries in the name of philosophy, which clothe their barrenness in the garments of profound generalization, and scout the humane ends of utility which science aims to subserve. With these the true philosopher has as little patience as the true scientist, and it is his purpose as well as his interest to rid his vocation of the stigma which popular feeling and scientific criticism unite in casting upon it, and in which the voice of history none too loudly joins. Philosophy has been a screen for the scientific charlatan; in her marble halls she has sheltered the mystic, the rhapsodist, the dreamer; and certain of her geniuses, the greatest intellects the world has seen, have lost their moral birthright and even their good name in the maze of guess-work which the irony of scientific men denominates metaphysics. But this is our misfortune as largely as our fault, and the sober thinkers of to-day are at one with the workers in science in demanding the restatement of philosophical problems in terms which admit of the application of exact methods, and imply reverence for the humblest truth.

The return to experience in philosophy is as much needed as the return to philosophy is needed in the sciences of experience. Empiricism will not secure science, and speculation alone will afford no true basis for philosophy. The scientist must needs be a philosopher, and because in the past he has partially realized this need science has made advances; on the other hand, the philosopher must needs be a scientist, and it is because in the past he has not realized this need that philosophy has not claimed her share in the discovery and application of truth. The philosophical function of the scientist is found in the imaginative construction which foreruns discovery; the philosopher builds his

construction wider, but its foundation is where the scientist has laid it. The two disciplines are therefore necessary to each other, and their place is side by side in a liberal education. The elements of scientific method should precede abstract philosophy, and the later development of speculation should rest at once upon the data drawn from the laboratory and the museum, on the one hand, and from the gallery of the mind on the other, where are found the specimens of the psychologist; that is, in facts within and facts without philosophy takes its rise.

This demand has found fruit and practical justification in late years in the new directions in which philosophy has turned inquiry, and in the more exact methods by which many questions before regarded as simply speculative have been approached. In psychology the effect has been as marked for its novelty as for its healthful stimulus. Comparative and experimental psychology are the direct outgrowth of the modern scientific spirit, and it is to the merit of contemporary philosophy that the new work is receiving its hearty endorsement. M. Ribot may see in this movement the decay of speculation prophesied by Comte, and Dr. Maudsley may declare that an organic theory of mental unity seems, in view of the newer results, to be the most probable hypothesis; but other workers insist that no results so far established by physiological psychology give even presumptive improbability to a spiritual and ideal theory of mind. I speak here with the conviction arrived at through earnest study in the laboratory and with the physicist, and with the caution which is born of a realization of unsettled problems, and I say that neurological and psycho-physical research has done no hurt to an idealistic philosophy.

But further than this, this is just the field in which

philosophy may redeem its reputation, and show its ability and willingness to handle its own problems in an exact way. Shall I give up my study of the mind because the physiologist challenges me to a searching examination of the points of common interest to him and to me? Shall I abandon the field to him, at the same time refusing to accept the results which he attains by laborious research? However just my refusal of his results may be, it can be justified only after an intelligent estimate of his work. No, my better part is to join with him in a common effort, rendered more effectual perhaps by the combined gifts of the scientist and the philosopher, and render assistance in the search for truth which is of the utmost importance both for the science of the organism and for the theory of the mind. This active interest in experimental psychology and a personal preparation for such work no professor of philosophy in this generation should lack, in justice to his students and to truth. For the questions of neuro-psychology are receiving just now as much attention as are the questions either of pure physiology or of pure mental science. Psycho-physical laborations are growing in number and in importance, and special organs are being devoted to the publication of their results. No university course in mental science is now complete which does not present at least the methods and main results of scientific psychology, and the larger institutions in both worlds are seeking men of proper training for exact and original work. This certainly indicates progress. If the additions which are being made are additions of fact outside the sphere of mind, they are valuable at least for physiology; but if they bear in any way, however remotely, upon the mental, we should be free to enlarge our view of the sphere and aim of mental philosophy.

Such study, however, should come after the descriptive and introspective study of the mind, and after the principles of logic, especially inductive logic, have been mastered. We shall then expect students who take philosophy freely to be better observers and reasoners than their fellows when they come to more advanced work either in philosophy or in science.

In the study of literature and language the function of philosophy is plain, and its value the philologist and literary critic are generally quite ready to admit. Comparative philology finds its fundamental explanation in comparative psychology, and the latter is only possible on the basis of a training in the interpretation of mental movements. The conjectures of the philologist and the hypotheses of the anthropologist may sometimes be confirmed or corrected by a simple reference to the psychology of speech and the laws of the growth of conceptions. The study of the child mind, so long neglected by philosophers, but now becoming very important to mental theory, throws great light upon the growth of idioms of speech, grammatical forms and rhetorical rules, and is the only source of such information open to the philologist. What is language but the expression of higher mental processes in their different stages, and who is able to interpret its forms and criticise its adequacy better than he who understands the mental movements of which it is the expression?

A further relation also exists between the student of language and the speculative thinker, namely, this: language is the product of human faculty, a record of human experience and achievement, and it is itself a part of that general humanity or life in which philosophy finds its problems. Not only then must the student of language,

in its deeper relations and meaning, see its bearing upon the more general hypotheses which philosophy advances, but the philosopher is true to the conditions of his problem only as he is himself a philologist, or stands in the most sympathetic attitude towards the results of philological study.

Of literary criticism and composition the same may be said, but with added emphasis. The canons of literary art and appreciation are involved, in an intimate way, in our developed world-theory. Æsthetics cannot be scientific unless it be true subjectively; that is, all æsthetic composition is a matter of the constructive imagination, its subject matter, its poetic form, its adequate execution, all appeal to the ideal estimate to which philosophy seeks to give formulation. The questions which spring up around the æsthetic problem take deep hold upon the relations of life. The points of most lively present discussion in literature and art turn upon our view of philosophic ethics and its relation to our sense of the beautiful. Who can write with authority on realism in art? Certainly not the man who has no knowledge of the principles of ethics in their social application, on the one hand, and their relation to mental ideals on the other. I do not mean that literary taste is a matter of learning; but it is nevertheless true that the critic, the instructor, must be able to throw his canons of taste and execution into form if he would justify the general principles of his distinctive school, or if he would instruct the intellect and refine the taste of the student; and all such formulations contribute to the philosophy of literature and art.

The relation of this department to political and economic theories is also close and important. The theory

of the state is one of the most difficult of philosophical problems, and its solution waits upon the decision of the psychologist and moralist. The most potent criticisms urged against the social visionary are drawn from psychology; we say that his utopia is impossible while man is constituted as he is, that is, while mental laws, passions, impulses, temperaments, are what they are. We go to the philosopher for the foundations of a political and social system under which man can work out his destiny. Society itself and the state are developed products of the human mind, and so the philosophy of human life must explain and justify society and the state. There is no other department of thought which takes so deep a hold upon popular morals and brings so prominently into view the popular character as the political. We cannot divorce our politics from our morals, nor our estimate of political desert from our judgment of personal character! But at the same time uninstructed popular movements are nowhere more damaging and extravagant, and nowhere else is there such a field for the arts of logical and emotional sophistry. Hence the necessity for the codification, the unification, the philosophy of duties and rights which is law. Individual thought and impulse is not law, individual conscience is not law; but how do we know this, if not by the recognition of a universal of thought and a universal of conduct, two great departments of philosophy? The economist and the legislator must understand human motives if they would construct a policy or form a statute opportunely. The only capable student of political and general history, and the only safe guardian of national franchise, is the man who knows something of the historic development of the human mind as seen in institutions, and knows on the other hand how to lead the popular thought of a constit-

uency to a higher plane of political theory. The dreamer in politics is, perhaps, more dangerous than the dreamer in philosophy, but he is always a dreamer in philosophy before he becomes a dreamer in politics; and on the other hand the safest exponent of political progress is the man who studies most closely the laws of motive in conduct and the growth of ethical conceptions among the people.

Such, in brief and defective outline, is the place and function of philosophy in the modern university, and certainly such a theme or aggregate of themes is broad enough for a host of workers. No one man can by any combination of gifts or courses of preparation do justice to this programme and at the same time do justice to himself. Hence many separate chairs are now devoted to this work in the larger institutions, chairs of Psychology, general and experimental, Logic, Ethics, Philosophy of Religion, Metaphysics, History of Philosophy, Pedagogics, and Æsthetics.

The magnifying of philosophy, therefore, in view of what has been said, is not the magnifying of one branch of study at the expense of others, or of one mode of intellectual discipline in contrast with another; it is, rather, the magnifying of study and discipline. Its concern is to reach the statement of facts which underlie all knowledge, and of rules for the conduct of the understanding in the various lines of research. It aims to make men vigorous thinkers, awake to alternatives, patient of hypotheses, cautious of conclusions, able in attack and defence, liberal and catholic in opinion. Excessive literary culture makes men in some degree erudite, pedantic, nearsighted to truth: excessive scientific culture makes men in some degree positive, syllogistic, unsympathetic to

the more problematical bearings of truth; philosophical culture makes men, or should make men, judicial, tolerant, alive to the infinite possibilities of truth, and full of reverence for truthful thought and most of all for truthful life.

## II

### THE IDEALISM OF SPINOZA[1]

RECENT years have been rich in discussions of the historical position and work of the Jew Spinoza. His life has always had a singular charm and attractiveness from its stern uprightness and frank independence, and it has been a protest against the unjust personal attacks of many — theologians often — who fail to discriminate between opinion which is individual, and life which is universal. The man who thinks true but lives false is worse than the man who thinks false but lives true; and history utters few clearer and more emphatic words than those she uses to tell of Spinoza's nobility and grandeur of character. And yet Dr. Hodge, writing from the standpoint of dogmatic theology, is right in placing Spinoza in the front of the host of modern destructive rationalists, as every one knows who appreciates the Spinoza revival of the eighteenth century. Herder and the author of the Wolfenbüttel fragments have a distinct background of Spinozism. Goethe said Spinoza was one of the overpowering influences of his life, and no one doubts it who reads the *Geheimnisse*.

[1] This paper was written with especial reference to Sir F. Pollock's *Spinoza, his Life and Philosophy*, 1st ed., London, 1880 (a revised second edition appeared in 1899). Other English works which may be consulted are: Martineau, *Study of Spinoza*, and *Types of Ethical Theory*, chapter iii., bk. i., Sigwart, *Der Spinozismus*, and the historians (Ueberweg, Fischer, Erdmann). (From *The Presbyterian Review*, Jan., 1889.)

Schleiermacher would have been impossible without Spinoza.

This is all true, and Spinozism is rightly considered the force that makes for Pantheism; yet in philosophy we look at the foundations of things, and while we may contend strenuously with a man about our theological system, we do it the more hopefully when he is one with us in the fundamental postulates of our world theory. And so much the more if his sympathies are human and his aspirations Godward. In metaphysics Spinoza is on the side of Theism, the intuition of God, and pure morality; in the humanities he has been a preserving and cleansing power. The high idealistic tone of German literature, especially verse, was inspired and preserved by him, and a similar wave of spiritual perception swept over England when Coleridge in his own way reproduced direct from the pages of the *Ethics* the doctrine of an all-pervading Reason and Love. Theology may have as much to fear from pantheism and mystic idealism as from absolute scepticism or sensationalism — as much to fear from Spinoza as from Hume or D'Alembert — but philosophy has not, and for the same reason that an earthquake does more damage at the top of a building than at the bottom.

The question, "Is Spinoza an idealist?" has arisen, I think, largely from the fact spoken of above, that his influence has been decidedly idealistic, that is, idealistic in a broad human sense. A distinction must be carefully preserved between the high spiritual view of things which is sometimes called idealism, and the definite form of philosophic thought that bears that name in many different systems, just as we hear of a materialism of life and thinking, when strict materialism in a philosophical sense is quite inapplicable. The inquiry before

us is concerned exclusively with the rigid philosophical meaning of idealism. No one is disposed to doubt that Spinoza was a high spiritual thinker; our only question is: Does his system contain the germs of philosophic idealism, and if so is it an essential part of his thought, and what was his personal attitude toward it?

## I

There are several principles to be observed in the application of the historical method to the development of philosophic thought — principles which are evident enough in statement, but difficult of application. First, all such development must be founded upon undoubted fact. Comte's application of his "law of the three stages," Hegel's development of "reason" in ancient history, and Jacobi's exposition of Spinoza, are cases of the violation of this requirement through misunderstanding or misrepresentation. Second, all development must begin with the stage reached by the doctrine which is developing, and not with the starting-point of the doctrine which is subsequently developed. To the neglect of this law is due, I think, half the misconstruction in the history of modern philosophy. A library of Locke commentaries is useless to-day because they begin to estimate him not where he left off, but where Hume began. Locke was not an enemy of a-priorism, but of innate ideas; and to judge him rightly we must deal with the latter doctrine as it was developing, and not with the former as it was afterward developed. There is a broad gulf here, and it is not fair to blow Locke into it because his house was built on the windward side. Third, philosophic doctrines in their interdependence should exhibit a logical and essential rather than

an accidental connection. This principle is also of capital importance. The controversy as to the Platonism of the Sermon on the Mount[1] illustrates the difficulty of distinguishing accidental from essential resemblances in trains of thought. But the principle is plain. Of two conflicting doctrines, that must be neglected which is of less importance in the author's general system, rather than that which is essential and whose erasure will wreck the entire work of his hands. Without prejudging either we must accept as the author's opinion that which is clearly advocated by him.[2]

The *Ethics* of Spinoza is an effort to put a system of speculative metaphysics into strict mathematical form. Following the lead of Descartes, who made mathematical clearness and distinctness the test of necessary truth, Spinoza advanced certain self-evident propositions or axioms from which the closely linked chain of propositions and demonstrations depends. It is *Ethica ordine geometrica demonstrata.* His other writings are more or less special or practical in their subject-matter, and it is to this great work that our attention must be especially given.

It is evident at once to those who are at all familiar with the doctrine of Spinoza that implicit idealistic coloring, if it is to be found at all, must appear in the doctrine of "attributes." Remembering that to Spinoza "substance" is the absolute and infinite ground of all things, the self-caused, that of which nothing positive can be asserted or known, "that which is in itself

[1] See parallel drawn by Martineau, *Types of Ethical Theory*, i., pp. 78–80.

[2] An example of this is the conflict between Sir William Hamilton's doctrine of consciousness as the necessary characteristic of mind, and his theory of unconscious or "latent" mental images. The latter is his clearly expressed opinion.

and is conceived by itself," "whose concept needs not the concept of another thing for it to be formed from" (*Eth.*, Def. 3), we can understand the definition of attribute as "that which intellect perceives concerning substance, as constituting the essence thereof" (Def. 4); and again (Epist. 27), "it is called attribute with respect to the understanding, which attributes to substance such a determined nature as aforesaid." This definition of attribute, not as a manifestation of substance, but as what the intellect takes for a manifestation, looks immediately to the magnification of mind in relation to the world, a form of absolute idealism; yet while we admit this fully from the point of view of this single doctrine, we maintain that the system, as a whole, cannot bear this construction; that insistence upon this aspect of the doctrine of attribute overthrows the doctrine of substance and subverts the entire structure of the metaphysics; and that this looking toward idealism is foreign to Spinoza's own view of his work.

The argument may be conducted along the following lines:

1. All implicit development of Spinoza toward Idealism rests upon the theory of perception advocated in Def. 4.

2. This theory of perception is not necessary to the general system; indeed, it contradicts its fundamental conception.

3. Consequently this theory of perception must be modified in conformity with the great lines of Spinoza's thought, *i. e.*, it must be given the form of absolute[1] realism.

[1] Used in the sense of the "identity" philosophy, of which Spinoza is called the father.

## II

Turning to the development of the doctrine of attribute, we will remember that Spinoza's substance is not only infinite in its being, but also in its attributes. By definition it is "absolutely infinite, . . . consisting of infinite attributes, whereof each one expresses eternal and infinite being." If there were not an infinity of attributes the substance would not be absolutely infinite, for here would be an unfulfilled possibility of enlargement. Further, each of these attributes, partaking of the nature of the absolute, is infinite, or, to preserve the distinction of Def. 4, would be perceived as such by an infinite intelligence. Man is endowed with the power of perceiving two of these attributes, matter or extension, and mind — but not in their full extent. We can conceive an intelligence capable of mightier efforts than ours, of making the entire universe of thought and extension its object; this intellect would differ from ours in degree. And we can also conceive an intelligence that differs from ours in kind, one that is endowed with different capacities toward the absolute — that is, capable of perceiving attributes of which we know nothing, and differing from others of its kind, like ours, in degree. So in passing from our present state of knowledge of the attributes to the state of knowledge that infinite intelligence enjoys, we must pass through an infinite number of stages, each representing an infinitely diversified series of intellects. But reasoning again from the impossibility of an unrealized possibility in reference to the absolute or its attributes, we reach the startling declaration that whatever is possible is actual.[1] So all these

[1] *Eth.*, i., 16.

intellects must exist,[1] and we seem to be giving to intellect a prominence that is discouraging. Yet this process of multiplying intellects is based upon Def. 4 — that is, it starts from the fact of perception, and not from that of reality.[2]

But not only does intellect perceive the attributes in general, as one of these it perceives itself; and we have another line of idealistic development, noticed briefly by Mr. Pollock. Mind is counted twice. The unity of the attributes in the absolute gives the famous proposition, "*ordo et connexio rerum est ordo et connexio idearum.*" All the modifications, modes, of one of the attributes are accompanied by modifications in all the others — modifications that are identical in fact, though partaking in exhibition of the peculiarity of the attribute to which they belong. Pollock, following Erdmann, and perhaps Spinoza himself, uses the figure of infinite planes[3] of infinite magnitude to represent the attributes and identical figures drawn all over these planes to represent the modes. Spinoza's doctrine will admit of its further extension. Let us conceive all things under the name substance as concentrated at a point, and from this point expanding in attributes, radia-

[1] This seems to be hinted in Spinoza's answer (*Epist.* 68) to Tschirnhausen's objection (*Epist.* 67), where we find the expression "infinite minds." See also *Eth.*, ii., 7, and i., 10.

[2] Herbart reasons somewhat the same, likening Spinoza's doctrine of attribute to his own doctrine of "accidental view" (*zufällige Ansicht*). He says: "He who would draw idealism from this would greatly err. Of this enemy of the whole cosmology Spinoza thinks so little that he puts under the axioms of the second part these: 'Man thinks' and 'We are conscious of particular bodies variously affected,'" etc. (*Metaph.*, i., § 49).

[3] Lewes uses the figure of planes in the same connection; his use of *modes* also is the same as Spinoza's, although he seems not to be aware of it (*Problems of Life and Mind*, ii., 16–22).

ting in infinite planes in all directions, and so constituting an infinite sphere of existence.[1] Now let these planes be covered with figures varying infinitely in the limits of each plane, and not identical in the different planes. We know mind and body under different forms — under forms of thought and extension — and though, according to Spinoza, they are the same in essence, yet they are not perceived so by us. So these figures may differ in shape, provided they are reducible to an ultimate oneness.[2] To carry out the mathematical figure, let rectangular axes of three dimensions be drawn through the central point, and it is only necessary that all the figures in the plane of any two of these axes be reduced to the general equation of a circle in that plane, the common equation

$$x^2 + y^2 = a^2.$$

The resulting equation must be that of a circle, for the modes are themselves substance, constituting in the infinite mode the attribute, and in the great aggregate the universe, and the universe is represented as spherical.

With this still inadequate conception of Spinoza's mighty flight of speculation — in Heinze's judgment the mightiest that the world has seen since Plato — we must ask by whom this universe is to be perceived? There cannot be another infinite, for by the doctrine of "Sameness of Indiscernibles" held by Spinoza, it would be identical with the infinite we are considering. There

[1] Spinoza uses the word "globule," *Tract. de Deo et Homine.* This is the old scientific conception of the world, the stars being fixed in a spherical shell (so Anaximenes, Xenophanes, etc.), also current in Jewish speculations, with which Spinoza was no doubt familiar.

[2] Camerer says (*Die Lehre Spinozas*), quoting as authority *Eth.*, iii., 6: "Die Modi eines jeden Attributes involviren den Begriff *ihres* Attributes, nicht aber den eines Anderen."

cannot be an outside intellect less than infinite, for it would be inadequate to the conception. It must be perceived by some intellect, otherwise, by Def. 4, there would be no attributes. There is but one alternative remaining, and that is that the universe is perceived by the intellect that is within; that by reason of peculiar endowment, or by reason of its constitution as intellect, or by reason of an original pre-eminence in the world building, the attribute intellect wraps its mighty folds around all substantial existence. This is the alternative to which Pollock is compelled to drive Spinoza. He says:[1] "Spinoza seems to say that every mode of every attribute, other than thought, has a several mind or modification of thought to itself," and[2] "the modes of thought are numerically equal to the modes of all the other attributes together — in other words, thought, instead of being coequal with the infinity of the other attributes, is infinitely infinite." Again, in summing up the discussion: "*the intellect that perceives an attribute as constituting the essence of substance belongs to the attribute of thought.* Thus, if we push analysis farther, we find that thought swallows up all the other attributes, for all conceivable attributes turn out to be objective aspects of thought itself." The words in italics — which are mine — strikingly indicate the alternative just described. It should be noticed, again, that the whole difficulty here, as in the last case, arises from the *perception* of the attribute and not from its reality — *i. e.*, from Def. 4.

## III

Passing to the second stage of our argument, we are led to inquire what relation the doctrine of Def. 4 bears

[1] P. 172, commenting on *Epist.* 68. [2] P. 179.

to the general system of Spinoza. The strange inconsistency seen in defining substance as that of which no positive predication can be made, and then in postulating attributes of this substance, gives us at once the reason for the qualifying clause of Def. 4 — viz., that attributes are only what intellect "perceives concerning substance." Nothing can be asserted of substance, he declares, for all assertion is definition; if negative, then limitative, and if positive, then predicative; and definition is to Spinoza subsumption.[1] But substance as defined (Def. 3) is incapable of subsumption; consequently, no attribute can be asserted *in reality*, and the only way to reach phenomenal existence at all is to make extension and thought attributes *in perception.*

The application of the third of the canons of criticism already laid down leaves us no doubt as to which of these alternatives is Spinoza's real view. His doctrine of substance, on the one hand, is the corner-stone of his metaphysics. His first work,[2] discovered latest, and probably dating back to the time of his excommunication, when he was most completely under the leading of Descartes, announces the unity of God or substance, and reasons *à priori* therefrom. The unity and uniformity of nature is the supreme principle of the later developed "system of nature" and of the "psychology," and this leads directly to the doctrine of the absolute and ultimate sameness of the attributes in their identical substance. This is given its due importance by Pollock. He says:[3] "The first and leading idea in Spinoza's philosophy is that of the unity and uniformity

[1] *Determinatio est negatio, Epist.* 50. Cf. Schwegler, *Geschichte der Philosophie in Umriss*, p. 106.

[2] *De Deo et Homine*, Germ. translation by Auerbach, in collected works, ed. of 1871.

[3] P. 84. Cf. Zeller, *Geschichte d. deutschen Philosophie*, 2d ed., p. 51.

of the world." In the "psychology" this doctrine, as has been often pointed out, is the historical culmination of the discussions which had given rise to the dualism of Descartes, the "occasionalism" of Malebranche, and the "pre-established harmony" of Leibnitz; and as a solution of the problem of the interaction of body and mind, it anticipates the "double-aspect theory" as held to-day by the "identity" philosophers of Germany and the positivists of England and France. It is therefore sufficiently clear that the doctrine of one absolute substance, with all that it carries in its train, is essential to the thought of Spinoza.

On the other hand, the distinction between an attribute and what the mind takes for an attribute seems to be an after-thought. We have no evidence that the distinction between noumenon and phenomenon, absolute and relative, things in themselves as opposed to things as they appear, was current until Kant. At any rate, Spinoza nowhere urges it, as is admitted by Pollock in a remarkable passage. "The manifestations," he says,[1] "are themselves the reality. Substance consists of attributes, and has no reality other than theirs. As for the suggestion that the perception of the understanding in this respect may be illusory — in other words, that the reality of things is unknowable — it is one which Spinoza was incapable of entertaining; it is wholly foreign to his thought, and I submit that it ought to be to all sound thinking. . . . To me it amounts to a contradiction in terms to speak of unknowable existence in an absolute sense. I cannot tell what existence means if not the possibility of being known or perceived." This is going to the utmost length in attributing realism to Spinoza, and though it is correct from the analogy of Spinoza's

[1] P. 163. See also p. 299.

thought, as will be shown, yet it destroys utterly the distinction drawn in the definition of attribute, and which is our only warrant for an idealistic development. If Spinoza was incapable of entertaining the suggestion that the perception of the understanding may be illusory, then he meant nothing by distinguishing between attributes as they are and as they are perceived, and the ground of our idealism disappears. Yet the assertion that this distinction is foreign to his thought is too strong, and cannot be maintained. The words of Epistle 27 are unmistakable: "I understand the same by attribute (or by substance), except that it is called attribute with respect to the understanding."[1] And again:[2] "The understanding must apprehend the attributes and affections of God, and nothing else." Proposition 10 of the *Ethics* is merely an enlargement of this distinction, and without it can have no place in the teaching of Spinoza.[3]

There is no difference of opinion, therefore, as to the relative importance of the doctrines under discussion. Common consent seems to indicate and fairness seems to require that the doctrine of substance be the starting-point for the development, that Spinoza himself regarded it so, and that while the distinction of Def. 4 is a real one, and if maintained carries unlimited idealistic possibilities, yet its development is made impossible by the inherent contradictions to which it gives rise.[4]

[1] Pollock's translation.

[2] *Eth.*, i., 30.

[3] Cf. Erdmann's strong position, *Gesch. d. Philos.*, 3d ed., ii., p. 59 (sentence beginning, *Was endlich den Spinoza selbst betrifft*, etc.). This distinction is the basis of Martineau's classification of Spinoza's system as immanental rather than transcendental, although there are infinity-less-two transcendent attributes (*Types of Eth. Theory*).

[4] That the balance of these two views of the attributes is not well

## IV

Let us, then, attempt to interpret Spinoza in the terms of our general result — *i. e.*, the removal of the condition of perception in the definition of attribute, in such a way that the universe is looked at artificially and simply as an external fact with which our mind has nothing to do. Thought is not really external to the universe — otherwise it had lost an attribute — but thought is entirely correlative with extension and innumerable other attributes. The results in the direction of idealism are striking in the extreme. The infinite stages of intellect, each representing infinitely diversified orders, will be no longer necessary; for they arise for the complete perception of the attributes, and the necessity for this perception is gone. And not only will they be unnecessary, but they will be impossible. Thought is one of the attributes co-ordinate and correlative with all the others, each of which is infinite, and to multiply intellects to the extension of thought beyond infinity is to institute a disparaging comparison of infinites, which is impossible. Thought is limited to its peculiar sphere,

maintained in Spinoza's mind is clear from his declaration of the *independence* of the attributes as perceived. They are to be thought of as in themselves individually, but yet as constituting substance. See Herbart, *Metaph.*, i., § 41, and Fischer, *Geschichte*, i., pt. 2, p. 285.

It is difficult to say just what Pollock means by idealism in this connection; probably only a tendency to subjectivism. It is not "subjective idealism which turns the world into a phantom," for he expressly disclaims this for Spinoza (p. 49), although in so doing he is not true to his reasoning on p. 175. Nor is it the milder Berkeleyan type, for on p. 170 we read: "It [Spinoza's system] is proof even against the objections to which Berkeley's Idealism is exposed." It seems to indicate only an undue and preponderating rôle given to the attribute mind. It is only necessary to interpret this in any one of the forms of historic idealism to see that Spinoza believed in none of them.

and we are freed from Pollock's charge that intellect is infinitely infinite. And in the other case, in which we found a passage to idealism, the same is true; the sphere of existence now rolls on without being perceived in its entirety. The attributes, arranged in symmetrical and correlated harmony, fulfil the functions of their original endowment. Thought and extension assume form respectively in the modes or individuals of whose reality we are sensible. Modifications in one give modifications in the other through the bond of a living unity, and infinite forms of unknown existence repeat the story of the change. Nor is it necessary to infer that thought and extension are peculiarly related to each other or more intimately than others of the attributes.[1] We know only the two, but in the plane of intellect there may be figures, modes, which, while reducible to the ultimate equation of intellect, perceive three, four, an indefinite number of attributes, with as clear a consciousness, in as intimate a relation, as we perceive our two.[2] There are points, for example, at which the spiritual world interpenetrates the natural, and while our vision is dim and misty, we still may see that it runs parallel and very near to our own.

But another piece of reasoning, and that in which Sir F. Pollock places most confidence in developing Spinoza toward idealism, remains to be considered, and to avoid misunderstanding, I quote the page at length.[3] It reads: "Let us now turn to the main point of Spinoza's implicit idealism. What is the conclusion to

[1] See Tschirnhausen's objection, already referred to, *Epist.* 65 and 67; also Pollock, pp. 171, 172.

[2] Spinoza's answer to Tschirnhausen. Erdmann, *Gesch. d. Philos.*, 3d Auf., Bd. ii., p. 60.

[3] Pp. 175, 176.

which it really points? What would Spinoza have done if he had not been hampered by a remnant of Cartesian dualism? We have to observe that each attribute is complete in itself; the possibility of mutual interference is rigorously excluded. The perception of things as extended is not a relation between the extended thing and the perceiving mind, for they are incommensurable. Every extended thing has its correlate in thought, whether that correlate is part of a conscious mind or not; and when it is a perception of a conscious mind, the perception is a mode of thought, and nothing else. And the thing correlated to the perception is not the object perceived, but the organism of the perceiving subject. The series of *ideas* or modes of thought is whole or continuous; no other attribute has any part in it. How, then, can we say that thought perceives extension? — or what ground have we for making extension co-ordinate with thought, and in some way which, nevertheless, is not causation, necessary to its manifestations? Putting out of sight the supposed *à priori* necessity for an infinity of attributes, let us assume extension and all its modes to be blotted out of existence. Thought and its modes will by the hypothesis remain unaffected; every mental correlate of a material fact will be precisely what it was before; the psychical order of things, *ordo et connexio idearum*, will be unaltered," etc.

This page, I venture to say, not only disregards the principle of exposition we are employing, but more especially ignores the great doctrine that Pollock himself places at the base of Spinoza's system — *i. e.*, the doctrine of the identity of the attributes, the oneness of substance. The author does not, indeed, substitute a lesser doctrine for a greater, but he rejects the greater

and leaves its place entirely vacant. To support this, I wish to take the propositions of the page in their succession, insert in each, when necessary to make it true to Spinoza, a clause illustrating the doctrine of unity, and note, finally, the result on the conclusion. He says: "Each attribute is complete in itself; the possibility of mutual interference is rigorously excluded;" — because of the incapacity of either attribute to modify itself. Again: "The perception of things as extended is not a relation between the extended thing and the perceiving mind, for they are incommensurable;" instead, the perception is a relation between the extended thing and the perceiving mind, arising from the capacity of mind to perceive the correlated modifications in extension. Again: "Every extended thing has its correlate in thought, . . . and the perception is a mode of thought, and nothing else;" instead, this perception is a mode of thought which has its corresponding modes in all the other attributes, including extension. Again: "The series of ideas or modes of thought is whole and continuous; no other attribute has any part in it;" instead of the last clause Spinoza teaches that all the other attributes have the same series.[1] Now the thesis: "Putting out of sight," etc., with the conclusion, "thought and its modes will remain unaffected," etc., as above. The incorrectness of this conclusion is now apparent. Thought and its modes, instead of remaining unaffected, will be blotted out with extension and its modes; every mental correlate of a material fact will disappear with the material fact of which it is the correlate.[2] The *ordo et connexio idearum* will no longer exist, as it is one with the *ordo et connexio rerum.* The effect

[1] *Ordo et connexio idearum est ordo et connexio rerum.*

[2] *Cf.* Hellferich, *Spinoza u. Leibnitz,* p. 35.

on the remaining propositions, which contain only an amplification of the conclusion, need not be followed out. Spinoza's true doctrine of the relation of thought to the universe is, I think, admirably brought out in Pollock's extension of the figure of the piano used by T. H. Huxley in his essay on Berkeley. It was only necessary for him to remain true to that exposition.

Finally, we should be justified in claiming for Spinoza a realistic theory of knowledge, as Pollock inadvertently admits in the passage already quoted. Spinoza says distinctly (*Eth.*, I., prop. 30): "For the true idea must necessarily agree with its object — that is, . . . what is present in the understanding as the object of thought must necessarily exist in nature." Again (*Eth.*, I., prop. 4) he says: "The attributes are *outside the intellect* (*extra intellectum*)." And, indeed, to him the attributes are the measure of reality. Substance, or God, is absolutely real or infinite only in that it has an infinity of attributes. "The more reality or existence anything has the more attributes belong to it" (*Eth.*, I., 9). Herbart owes his doctrine of "reals," as he himself has shown, to this singular conception of Spinoza's; and Martineau declares that no pre-Kantian reader could have put any other construction on Spinoza's words than that whatever *intellectus percipit* is real.[1]

What Spinoza might have done under the circumstances is an entirely different question, and one with which we are not concerned; much less are we concerned with the inquiry as to what he would have done if "unhampered by a remnant of Cartesian dualism." We must deal with him as a fact, with his system as he left it, and a statement of the result a change of conditions would have had upon his teaching can in no sense be called a devel-

[1] *Study of Spinoza*, p. 184.

opment. When Sir F. Pollock asks what ground we have for making extension co-ordinate with thought, he is asking whether Spinoza is right or not. This may be left to philosophers to discuss; it is the business of the historian to record and interpret.

# III

## RECENT DISCUSSION IN MATERIALISM[1]

THERE are phases of contemporary materialism which have little in common with the doctrines of ancient and mediæval materialists, and which in point of subtlety and philosophical attractiveness are quite in accord with the advanced position of nineteenth century thought. The idealist of to-day flatters himself that he avoids the inconsistencies of Berkeley and Fichte; so the materialist smiles at the mention of Priestley, D'Alembert, and Holbach. But these growths respectively in idealistic and materialistic thought have not been parallel. Idealism has tended in the last thirty years to withdraw its gaze from the thought-ultimate as a monistic conception to perception as a dualistic relation, that is, from cosmic to psychological idealism; while materialism has tended in quite the opposite direction, *i. e.*, from the crude postulate of matter in bulk to the search for an ultimate materialistic principle, that is, from psychological to cosmic materialism. Each has strengthened its flank, and the battle is now joined between psychological idealism and metaphysical materialism.

Spiritualism has gained vastly by this change of base. As long as the ontology of spirit rested upon a dogmatic assertion of universal mind, there was no weapon at hand wherewith to attack the corresponding assertion of

[1] From *The Presbyterian and Reformed Review*, 1890, p. 353.

universal matter. I have as good right to assert a universal as you have, and *çhacun à son goût* is the rule of choice. But now that philosophy is learning to value a single fact more than a detailed system, and is sacrificing its systems to the vindication of facts, it is spiritualism and not materialism which is profiting by the advances of science. Materialism has appealed to the metaphysics of force, spiritualism has appealed to conscious process. Which is more in harmony with the scientific spirit of the day?

The successive positions which modern materialism has taken in its necessary retreat into metaphysics, are interesting from a historical point of view. First it was matter and no mind; then matter with a function, mind; then matter, a force manifested in extension and mind; then force, which is doubtless matter — but may be mind. First mind was brain; then mind was a function of brain; then mind and brain were manifestations of a material principle; then the material principle became force, — which again may be mind.

## I

In stretching the lines of defence of the spiritualistic principle in psychology, we turn at once to the method of knowledge as a process, and we shall find it valuable for more than defence. For if we discover the independence of the thinking subject as regards the method, we may at once pass to its autonomy as regards the matter of the knowing process. That is, if we find a refutation of materialism in the psychology of knowing, we have so much the more ground for its refutation in the metaphysic of knowing, and the two considerations will present a consistent philosophy of knowing. What

then is the materialist's doctrine of the method of knowledge?

There are four cosmological doctrines of knowledge, arising from four types of world-theory, assuming that the parties to the controversy are only mind and matter. First, monism of thought; second, dualism of thought and matter (or force); third, absolute phenomenalism or agnosticism; and fourth, monism of matter (or force). On the first hypothesis, perception is a purely thought relation, and by definition the materialist cannot accept it. On the second, we have a realistic theory of knowledge in which the thought element rests upon the ultimate presupposition of thought and the materialist is again excluded. Upon the hypothesis of absolute phenomenalism the support is cut equally from both subject and object. If both be phenomenal, there can be no question as to which is real, and the materialist and idealist are both defeated. The fourth supposition, monism of matter or force, is then the materialist's only alternative, and the first problem we propound to him is this: Given matter or force, how do you account for thought? Is mind a function of organized matter?

The grounds upon which materialists have been led to assert that mind is motion, or in general some function of matter, are the principles of cosmic economy and uniformity of law; and they are in part justified as scientific. But the law of cosmic economy is inoperative except when cosmic outlay is purely hypothetical and when the phenomena in question may be explained in terms of the known. And the law of the uniformity of nature rests upon the principle of the conservation of energy, in this case upon the position that mental process is caused by physical forces and *vice versâ*. Just here we reach the question crucial to psychological mate-

rialism: Has physiological psychology led to the discovery of any process of transition from nerve force to thought? This may be answered unequivocally and emphatically no.

## II. Schiff's Experiments

Much has been made of the experiments of Schiff, whereby he has shown that mental operations are accompanied by a discharge of heat.[1] M. Luys says:[2] "These experiments show us, on the one hand, that sustained intellectual work is accompanied by a loss of phosphorized substance on the part of the cerebral cell in vibration; that it uses it up like an ignited pile which is burning away its own essential constituents; and that, on the other hand, all moral emotion perceived through the sensations becomes at the same time the occasion of a local development of heat." All this may be perfectly true and yet valueless for the debate. Every one admits that there is a loss of phosphorized substance during thought; but this phosphorus is found passing off in the ordinary channels of the body (Byasson and Beaunis), and this latter fact is used by Luys to prove the passage of thought back into a material form. In the first case, according to this ingenious thinker, phosphorus is expended during the intellectual operations, therefore (p. 78) "it (thought) uses it (phosphorus) up;" but phosphorus is also found passing from the body in the form of sulphates and phosphates and in increased quantities after periods of wakefulness and thought (Hammond), therefore (p. 70) these "serve as a chemical measure of the intensity of cerebral work

[1] *Archives de Physiologie*, 1870, p. 451.

[2] *Brain and its Functions*, pp. 78 and 79.

done in a given time." But, although it is a pity to interfere with this twofold transformation of energy, we deem it a much more credible hypothesis that the phosphorus of the cerebrum is the phosphorus of the passages, and that there has been no transformation at all.

On either of the hypotheses equally a development of heat is possible during the play of intellectual forces. If mind and brain are distinct, and brain a necessary organ of mind, heat may be the equivalent in whole or in part of cerebral activity. In short, the evolution of heat means only that molecular change is going on in the brain, and this is no very startling discovery.

## III. Bain's Sensational Equivalence

But to bring the question of correlation yet closer, what shall we say to Professor Bain's "sensational equivalent"? He says: "that there is a definite equivalence between mental manifestations and physical forces, the same as between the physical forces themselves, is, I think, conformable to all the facts. . . . Mental manifestations are in exact proportion to their physical supports. There is a sensational equivalent of heat, of food, of exercise, of sound, of light."[1] Let us examine the facts. I sit idly in my chair; the bell strikes one, and I hear it so distinctly that I am roused from my revery. I begin to read; the bell strikes two, three, four, and I am quite unconscious of the sound. Where is the sensational equivalent of sound? Gone with the passage of attention, a psycho-physical function. I plunge my hands successively into a basin of water; to one it

[1] "Correlation of Nervous and Mental Force," in Stewart's *Conservation of Energy*.

is warm, to the other cold. Where is the sensational equivalent of heat? Gone in relativity — partially, at least, a subjective estimation. I light a candle and my page is illuminated; then a second, and the illumination is scarcely increased. Where is the sensational equivalent of light? If it be said that changes in bodily condition alter the equivalent, we reply: How will you avoid these changes in establishing the equivalent? It is like saying that conscience is uniform in its utterances, or would be if some were not perverted. We have only to ask: If some are perverted, where do you find the consensus of consciences which proves their uniformity? By actual experiment, the bodily conditions have been ruled out to a very great degree and a law approached which indicates uniformity of sensational contingence, but no such thing as sensational equivalence. We mean Fechner's logarithmic law of the ratio of growth between stimulus and sensation. Here is a uniformity of contingence such as we find constantly in nature in cases in which there is no proof of transformation or correlation of energy. My reading is contingent upon the burning of the gas, but who would say that the consumption of gas caused my reading, or that the energy of gas consumption passed into my thought? So, if mind operations be contingent upon brain operations, would we not expect uniformity in this contingency?

And the further parallel, drawn with great distinctness by Luys, Büchner, and Bain, between the healthy discharge of brain functions and the activity of mind, between the necessity for the regular feeding of the cortical cells and the free coursing of rich blood and the manifestations of clearness in thought, is just as true on one hypothesis as on the other. If mind works by cells, it works better by healthy cells, and if a whole

brain is necessary to the normal activity of mind, the removal of part of the brain necessarily deranges mind. We fail to see wherein this aspect of the facts supports one hypothesis rather than the other.

If the case is thus in reference to a sensation equivalent, it is more unmistakable in reference to a thought equivalent, unless we be able to resolve all mental processes into sensation; and even under this unfulfilled condition we must pass from intensity, considered as a force equivalent of stimulus, to consciousness as such, an altogether new and subjective property. This has never been done. The last utterance of Professor Huxley is this:[1] "I cannot conceive how the phenomena of consciousness as such and apart from the physical process by which they are called into existence, are to be brought within the bounds of physical science. Take, for example, the feeling of redness. . . . Let us suppose the process of physical analysis pushed so far that one could view the last link of the chain of molecules, watch their movements as if they were billiard-balls, weigh them, measure them and know all that is physically knowable about them. . . . We should be just as far from being able to include the resulting phenomena of consciousness, the feeling of redness, within the bounds of physical science, as we are at present. It would remain as unlike the phenomena we know under the names of matter and motion as it is now." And again: "It seems to me pretty plain that there is a third thing in the universe, to wit, consciousness, which, in the hardness of my head and heart, I cannot see to be matter or force, or any conceivable modification of either, however intimately the manifestations of the phenomena of consciousness

[1] "Science and Morals," reply to Mr. Lilly, in *Fortnightly Review*, Dec., 1885.

may be connected with the phenomena we know as matter and force." We accept this opinion, however true it may be to Professor Huxley that he "finds even greater difficulties in exchanging the notes-of-hand of spiritualism for the solid coin of reality." Not only cannot consciousness be brought within the bounds of physical science, but physical science must be brought within the bounds of consciousness. Matter, force, physical science, *as science*, are nonentities outside of consciousness, that is, they are reducible, and the only irreducible we have left is consciousness, or thought. Professor Huxley may hold up his hands and cry, "I am an agnostic," if he choose, after admitting that "the arguments used by Descartes and Berkeley to show that our certain knowledge does not extend beyond our states of consciousness, appear to me as irrefragable now as they did when I first became acquainted with them some thirty years ago;" but we feel compelled by logical consistency to admit that our one certainty not only is, but, by the necessities of conscious perception, always must be the existence of a mental world.

The difficulties grow more insurmountable as mental phenomena advance in complexity. Bain, Lewes, Spencer, and Guyau have not shown that thought is a complex of sensations and much less that sensation supplies the forms of this complexity. Where, for example, is causation? Let Professor Huxley speak again: "If there is anything in the world which I do firmly believe in, it is the universal validity of the law of causation, but that universality cannot be proved by any amount of experience, let alone that which comes to us through the senses. And when an effort of volition changes the current of my thoughts, or when an idea calls up another asso-

ciated idea, I have not the slightest doubt that the process to which the first of the phenomena in each case is due, stands in the relation of cause to the second. Yet the attempt to verify this belief by sensation would be sheer lunacy." The judgment, attention, apperception, the will, to say nothing of conscious continuity and personal identity, all stand unaccounted for. Not only must the materialist bridge the chasm to consciousness with supplies of new material, but he must elaborate this material into the rich texture of our thought and further he must build the loom and supply the motive power to weave these splendid tapestries.

## IV. Double Aspect Theory

Whatever else consciousness be, it makes possible all experience. This is where the double aspect theory fails, and fails despite Professor Wundt's subtle effort to make it secure. If mind and matter are two aspects of one truth, what is this truth? The spiritualist answers: "If they are aspects, they are aspects to me, that is, the me antedates the aspects; but the me is itself an aspect, hence there is but one aspect." Professor Wundt replies: "Not so; admitting the twofoldness of perception, subject and object are both real in perception. But by the law of consciousness the object is the not-me plus the me. Subtracting the me, we have left the not-me unknown forever by the terms of perception, but a substance objective to the me. Now of the me we cannot say that it is a substance, for though it is known immediately, it is not known substantively. The me is known only in the manifestations of thought. Consequently no such substance as mind can be postulated, and if we be driven to assert a monism, from percep-

tion alone, that is, a substantive monism, it must be a monism of the not-me." Professor Wundt, it is true, is saved from this conclusion by the spiritual element in his psychology; but if his premise be true that the me is known only as manifestation and the not-me is known in a complex with the me as manifestation, what hinders the inference that the me is a manifestation of the not-me, *i. e.*, materialistic monism?

We said that Professor Wundt is saved from this conclusion by the spiritual element in his psychology. Resulting from his detailed and labored analysis of mental processes, viewed from a physiological point of view, he finds two irreducible elements, sensation and will. He contends that from these two data the whole intellectual life can be built up. Of these that which bears more unmistakable signs of ultimateness is the will. Here he is in accord with the new spiritualists of England and France. But unlike them in that they maintain a knowledge of self as power, he is compelled to reconcile the will functionally with his position already described that the not-me is the only known substance. For this reconciliation he resorts to the monadology of Leibnitz. Given the two subjective irreducibles, sensation and will, we find their simplest common manifestation in instinct (*Trieb*): instinct then is the bond of reconciliation, and is to be sought in the automatic habits of animals, the morphological properties of plants, and the chemical processes of the inorganic world, until we reach the atom, which contains potentially both the substantive not-me and the feeling and willing me.

This position is strengthened by a resort to the Hegelian logic. Professor Wundt maintains in his *Logik*,[1] with Vacherot in France and the Neo-Hegelians in Eng-

[1] *Logik*, i., p. 32.

land, that the "substance of things is the unity of thought," or, in his own words,[1] that "the fundamental laws of logical thought are at once laws of the objects of thought." Thus nature is realized thought and the substantive not-me is, from an external point of view, "so expanded that it includes also in one substance-complex the psychic life manifestations:" while from an internal point of view, the not-me becomes a manifestation of thought. So we reach in the atom the substance of which mind and matter are the double faces; or, to use his own words, "this substance in motion is the bearer of the psychic elementary phenomenon, instinct."

To this very closely woven theory, several exceptions might be taken. In the first place, it might be denied that sensation, as such, is a mental ultimate; there is a conscious form even in sensation. Conscious form, then, might be taken with will as our ultimates. We then might assert that instinct is not the synthesis of these ultimates, will and consciousness. Instinct, as Wundt defines it, may be both involuntary and unconscious.

Again, upon this theory there must be a continuity of both aspects throughout the entire scale of plant and animal life as well as in the inorganic world; yet we have no evidence of any internal aspect when we pass out of the animal kingdom. There is an objective rationality no doubt in crystallization, but we can assert neither feeling nor will, and to admit the absence of either of these is to admit either that the inner aspect is absent or that feeling and will are not mental ultimates. Wundt refers the absence of consciousness to the absence of those conditions of permanent equilibrium which are necessary to higher organized life, admitting that inorganic matter has momentary flashes of

[1] *Physiologische Psychologie*, 2d ed., ii., p. 452.

consciousness. If sensation is ultimate and necessary to instinct, there can be no such thing as "unconscious instinct elements."

But, further, admitting for the moment the existence of unconscious instinct elements, thus allowing to the atom an inner aspect, what have we gained by its pursuit? Mind and brain are inner and outer aspects of an unknown substance. To explain this dual inherence, we postulate an atom having inner and outer aspects, but whose substance is unknown. If the atom have not the two aspects, we cannot reach them in man; if the atom have the two aspects, we do not account for them in man.

And yet again, admitting Wundt's position that nature is realized thought and the processes of nature processes of the realization of thought, we deduce two important inferences. First, complexity of organism is the reflection and not the cause of complexity of thought, the opposite of the position of materialistic evolution. Wundt has actually drawn this inference. And, second, since thought must logically precede its realization, the inner must precede the outer aspect, and our monism is, after all, a monism of mind.

## V. Maudsley's Organic Unity of Mind[1]

In an article in *Mind*, No. 54, Dr. Maudsley sums up the main argument of his *Physiology and Pathology of Mind* in three great points, which may be stated logically thus: First, the brain, as the organ of consciousness or thought, is capable of dual activity, this

[1] This section has been published substantially in *Mind* (London), October, 1889.

duality making it impossible for us to look for any unity in consciousness as far as the thought processes alone are concerned; second, the real unity of self is to be found in the affective or emotional life, which, third, finds its basal principle of unity in the organic unity of the body, *i. e.*, in the nervous system. These points are closely interwoven, and present an account of the mental life to which spiritualists generally take broad exception. It is my purpose to indicate some considerations from a psychological standpoint, which tend to show that Dr. Maudsley's physiological data do not suffice for the interpretation he gives them.

The facts bearing upon the dual nature of the hemispheres and the functional interpretation of them in regard to movement which Dr. Maudsley gives are conceded from the outset. It seems to be established that, besides the common functional activity of the hemispheres, that area over which they both have dominion, there is a something left to each alone, a large body of motor functions peculiar to each; and that either may dictate the performance of their common function, together with that which is peculiar to itself. It is when we pass on to consider "how the hemispheres act toward one another in thinking" (p. 166), that is, how they are related to each other as respects consciousness and its unity, that the question of psychological interest arises.

In answering this question, Dr. Maudsley first cites the case in which we attempt to perform movements involving the separate activity of the hemispheres, as the performance of different movements with the two hands. He says (p. 166): "If a person who is performing one kind of act with one hand and another kind of act with the other hand, will endeavor to think of both

acts at the same moment, he will discover that he cannot do so; although he can execute the different movements simultaneously, he cannot think them simultaneously; he must pass in thought from one to the other, a rapid alternation of consciousness takes place. This alternation, though rapid, is by no means simultaneous; it is distinctly successive, since there is an appreciable pause in the performance of it." After excluding other alternatives, such as the co-existence of different consciousnesses, he concludes that "there remains the supposition of an alternating action of the hemispheres corresponding to the alternating consciousness." This alternation, he goes on to show, gradually yields, on the part of the hemispheres, through repetition and education, to their union in simultaneous activity as a single organ (166), but consciousness preserves its method of "extremely rapid alternations." The conclusion, therefore, as respects intellectual unity, is that we find no basis for it in the functional activity of the hemispheres.

This conclusion may be true, but the analysis it involves of the psychological unity of the states involved is so meagre and false that we cannot take it alone with us in our search for the true principle of unity. By consciousness in this connection Dr. Maudsley seems to mean *attention*. It is true that I cannot attend to the two movements at once, that my attention alternates usually even when the movements are simultaneous, but it is not true that I may not be conscious of the two movements at once. Repetition tends to make them elements of a single state of consciousness, just as repetition tends to make the hemispheres a single unit organ. A simultaneous consciousness is not a "distracted or dual consciousness," but an *integrated* consciousness, a new state whose elements are drawn from previous

states. Attention is a state of monoïdeism, but consciousness is not.

Now this integration of states is possible only on the basis of a certain conscious unity as necessary to the mental life, as organic unity is to the members of the body in their variety of physical functions. If I move my right thumb to the left, is the movement my only consciousness? Am I not conscious that it is *my* thumb, *my* movement? Are there not unnumbered organic, detached, stray peripheral sensations bound up with the act or with its very thought? And when I shift my attention and move my left thumb to the right, is there a pause in my consciousness of *all* these things? Not at all; I am just as conscious of my thumbs, of my organic affections, of myself, between the movements or during them. A simple change in my motor experience can in no sense be said to create a pause or break in my consciousness. Each hemisphere, instead of contributing a separate consciousness, contributes an element to my single consciousness — in this case a motor element. And further, attention itself as a principle of active unity is dependent upon the complexity of the mental life. The selecting, relating, unifying, disposing function of attention has been so emphasized in recent discussion that it is needless to dwell upon it.

I have thus briefly touched upon three elements of mental unity which analysis seems to give and which demand explanation whatever hypothesis we adopt. First, the subjective value of all modifications, both sensor and motor; second, the subordination of *incidents* in consciousness, past and present, to the permanence of consciousness itself, which persists as the background of their flow; third, the grasping and disposing movement of attention, which is *always one*. The class of move-

ments hitherto spoken of, *i. e.*, those which are controlled by the hemispheres individually, with no co-operation, bear only upon what are now called incidents and not upon the persisting aspect of mental unity.

If the case rested simply upon this class of movements, Dr. Maudsley might strengthen himself by extending the difference of function not to the two hemispheres alone, but to each of the motor areas within each hemisphere. The centre for speech, for example, is probably distinct from the centre for the movement of the lower limbs. We can perform the two functions — say speaking and walking — simultaneously, but cannot attend to them simultaneously until a close association is brought about by education. Therefore, it might be argued that motor consciousness is a matter of successive states and lacks unity. From this point of view we have not two brains (centres), but, perhaps, a dozen. But the unity of the mental life, which the motor consciousness is here taken to represent, remains quite untouched.

Dr. Maudsley next proceeds to consider those movements in which the hemispheres co-operate; they "combine to dictate different movements of the two sides for a common end, just as the eyes combine the different visions of one object." The question is this: "From what higher source do the hemispheres obtain their governing principle of unity? How is it that when dictating different movements they yet have an understanding to work together to a common end?" And his answer is again that the unity of the motor consciousness is an educated unity, and that, like two acrobats, they learn to perform together "by much travail and pain." This is true and its importance is properly estimated; but it also must be criticised on the ground of what it leaves out. We are forced at

once to inquire: Whose is the "end or aim in view," the "conception or foresight of the act, its ideal accomplishment"? Certainly not the conception of the hemispheres themselves, though the figure of the acrobats would lead us to think so; for how could such a conception be acquired by the hemispheres before the action had been actually performed? And if thus acquired, how could they unite in it without a central bureau of consciousness where the progress of the co-ordination of movement might be apprehended and recorded? The conception which precedes all effort at motor execution is a fact or scheme of unity, mental unity, an ideal unity of the motor consciousness to which the complex activity of the motor apparatus is to be reduced by long and wearisome effort. Here, as in the former case, we find no fault with the account of what takes place in and for the motor consciousness; but we cannot see how this consciousness can be considered for itself alone in independence of the higher thought consciousness in which alone the idea of motor co-operation germinates and bears fruit.

The other figure which Dr. Maudsley uses in this connection makes the case still plainer. He says the hemispheres are related to each other, in such co-ordinated movements, as the eyes are in binocular vision, their early binary images being reduced by experience to a unitary perception. But the eyes do not accomplish this themselves. Let us suppose the eyes to be the seat of consciousness. Now, either each eye has its consciousness, or there is a single consciousness for both eyes. If each has its own consciousness, neither eye could be conscious of its disagreement with the other and their results could never be reduced to unity. If there is one consciousness for both eyes, it is in virtue of this unit

consciousness that a unit perception is attained and not from anything in the eyes themselves; that is, it is only through the interpretation of a unit consciousness, in which both images as such are possible, that they can be reduced to the form of single vision.

The mental unity to be explained is something more profound than the simple consideration of these motor performances would lead us to expect; it remains to see whether the organic solution offered by Dr. Maudsley is adequate.

The two great questions here involved are these: Is the "unity of the intellectual life based upon the unity of feeling," and "this again upon the unity of the organic life"? These questions are so comprehensive and far-reaching that only a few general considerations can be advanced in this connection.

1. The same line of argument by which Dr. Maudsley and others[1] prove the absence of unity in the motor consciousness, applies with undiminished force to the affective (or feeling) consciousness. Can we attend to two simple sensations in two peripheral organs at once, say a taste and the pain of a wound in the hand? Not at all. The case is just the same as when we try to perform two movements on different sides at once. There is the same alternation of attention until the sensations become united in a single attention-complex. The isolation of single affective states in our adult life is open to the same charge of psychological atomism as has been found attaching to the similar isolation of motor states. Indeed, simple feelings of movement are largely qualitative affective states, and the argument from them applies to all states of the class. The feeling of effort which is bound up with movements seems to indicate

[1] Horwicz.

a higher plane of intellectual unity, which the theory in question leaves quite out of account.

2. We may well notice that neither the manifoldness nor the unity of feeling could be apprehended as such in the absence of a circumscribing consciousness which, through its own unity, takes it to be what it is. Suppose we admit that at the beginnings of life the inner state is simply an undifferentiated continuity of sensation; what is it that *feels* or *knows* the subsequent differentiation of parts of this continuity? It cannot be the unity of the continuity itself, for that is now destroyed; it cannot be the differentiated sensations themselves, for they are many. It can only be a unitary subjectivity additional to the unity of the sensory content, *i. e.*, a form of synthetic function which reduces the many to one in each and all of the stages of mental growth. The relations of ideas as units must be taken up into the unit idea of relation, to express what modern psychology means by apperception or the "mechanical connection" must become the "presented connection," to use the terms employed by Mr. Stout in *Mind*, No. 53.

3. It is difficult to see how the higher intellectual unity, of which I have spoken, can find its basal principle in the organic unity of the body. Admitting, with Dr. Maudsley, that mind exhibits organization, the progressive organization of residua, we are never able to go outside of the unity of consciousness to find such mental residua. Indeed, there can be no such thing as a residuum, except as it is the same in nature as that of which it is a residuum; and admitting further that the body is also an organization and an organization which proceeds in the most intimate and progressive parallelism with that of mind, we are yet unable to make mental organization a function of physical organization until

these propositions are established: (*a*) That the law of the organic and morphological growth of mind finds its proximate ground in the growth of body; that is, that the methods of physical organization run also into mental organization. Now, as a fact, the great principle of mental organization, apperceptive synthesis, so far resists this interpretation. It seems, as Lotze says, to work by a method which is unique. (*b*) That mind in its progressive organization does not exhibit stages or modes or form peculiarly its own. (*c*) That the two aspects of unity, physical and mental, are not themselves members of an underlying principle to which they are both secondary and which may be mind.

Contemporary thought is tending, I think, to the recognition of the fact — as wholesome to the idealist as to the materialist — that the personality is one, that it includes mind and body, that we know these only in an apparently inseparable union, that mind is not mind without an object and that an object is not an object without mind, that a within is as necessary to a without as a without is to a within, and that rational unity lies deeper in the nature of things than either the empirical unity of the atomistic psychology or the organic unity of the nervous system.[1]

[1] The question of psychophysical unity is taken up from the genetic point of view in the writer's *Mental Development in the Child and the Race*, chap. ix. § 3, chap. x. § 3, chap. xi. § 1, and the conclusion reached that the actual process involved is that of motor synthesis or "synergy" effected by practical adjustment of the motor apparatus and of the attention.

# IV

## PROFESSOR WATSON ON REALITY AND TIME[1]

In a recent interesting article, Professor Watson aims to clear up the relation of time to the absolute.[2] He devotes most of his space to preliminary considerations in psychology and to the examination of Bradley's conception of reality and McTaggart's recent exposition of Hegel's doctrines of the absolute and of time. Professor Watson's own view of the time-process in its relation to the absolute is stated only as it is implicated in these criticisms, the positive treatment being reserved for a later article. The conclusion which he thus announces is in these words: "An absolute which manifests itself in the time-process, and yet is self-complete." This view, however, must not be considered as the traditional "reality-behind-appearance-view" of the transcendentalists, as Professor Watson is at pains to say; it is much nearer, as the present writer understands it, from the partial statements of Mr. Watson, to the later view of Lotze as contained in the *Metaphysic* (as contrasted with the Lotze of the *Dictaten*). This may be made plainer by further quotation. Professor Watson says: "If the absolute is self-complete apart from the time-process, it cannot be manifested in that process; if it is manifested

[1] From the *Psychological Review*, September, 1895, pp. 490 ff.

[2] "The Absolute and the Time-process," *Philos. Review*, July, 1895, pp. 335 ff.

in the time-process, whether it is self-complete or not, at least it cannot be self-complete apart from the time-process, but the time-process is essential to its self-completeness." "We reject as self-contradictory the conception of the Absolute as self-complete apart from the time-process." Lotze's view, with all its ins and outs, is well presented by Falckenberg in his recent articles, and the pondering of his views, especially the distinction whereby he finds succession necessary to an Absolute which is changing reality, while duration cannot be so considered, leads us to see that his problem is very similar to that which Professor Watson takes up when he goes on to say "we are immediately confronted by the difficulty that a world that is in process does not seem to be self-complete."

It may not be fair at this stage of his discussion to anticipate that Professor Watson's solution will finally be similar to Caird's; and it is difficult to see how he can finally get an Absolute which will be free from the charge of being "static:" but there are indications in this article that Professor Watson, who has the just reputation of being one of the ablest of the "Intellectual Idealists," is going to work that kind of thinking free from some of the weaknesses with which it has been beset in the eyes of those who are unable to find in the dynamic categories simply the "telling-off," by us finites, of a series of intellectual terms.[1] What I mean by indications are these: Professor Watson in this article seems to recognize the need of some kind of an ontological construction of evolution, although there are indica-

[1] Since this was written there has been a considerable further development of voluntaristic and "pragmatic" points of view. The "dynamic categories" are given notable treatment in Ormond's *Foundations of Knowledge* (1900).

tions, too, that he may fall back on the resource to be found in the subjectivism of the category of change (pp. 367 f.). Further, Professor Watson shows a certain unexpected affiliation with Lotze again, in essentially agreeing that the question of metaphysics is "what reality is; not how it is made." He says: "If it is asked *why* the Absolute reveals itself gradually in the finite, I should answer that the question is absurd; we cannot go behind reality in order to explain why it is what it is; we can only state what its nature, as known to us, involves." Does not this seem to "indicate" that there may be some further agreement toward a dynamic view of reality, in spite of Professor Watson's contention that reality must be self-complete in the sense that it is intellectually "constructible"? Then there is a third "indication." It is found in the good piece of psychology which Mr. Watson gives us in this article in treating of conception and judgment. This psychological digression is not new in its teachings; it is a series of views made very clear by the newer logicians. I myself developed substantially the same views in the first edition of my *Handbook of Physiology*, vol. I., in 1889. But the use which Professor Watson makes of the "organization view," as I may call it, of conception and judgment, is what I find interesting. I shall speak of his point against Bradley further along; here it is enough to point out that Mr. Watson finds reality a function of progressive mental organization, thus denying the very possibility of a construction of reality apart from this organization itself.

How then can the inference be avoided that the absolute, also, *as real* arises by a mental construction? But we have no intellectual organization of which the untemporal, the logically self-complete, the undynamic, is

a function. Hence we find ourselves in the dilemma of either making the absolute subject of all the temporal and dynamic predicates or of denying its reality.

Professor Watson, it is true, appears to avoid this issue, and to content himself with the old antithesis of the intellectualists: "The consciousness of the finite presupposes the consciousness of the infinite" (p. 368), and "we are compelled to regard all finite or dependent being as presupposing a self-determining principle" (p. 368). But — why are we? I, for one, am not. To be sure, if we make a logical antithesis with a supposititious finite, defined as dependent, at one pole, we must go on and put a supposititious infinite at the other pole; but it is going back to scholastic logic to say that either must then have reality, or gets it by this logical dialectic. As a matter of fact, when I ask my consciousness for the mental organization which constitutes the conception "infinite," I do not find any such (and in my private view, neither is there any for the logical term "finite" — but this is by the way). If this be true, that there is no mental construction of any such object as the infinite or the absolute, how, on Mr. Watson's true psychology, can there be a function of it called its "reality"? Or is this the exception which proves the rule, in the doctrine of reality?

In his preliminary determination of the Absolute, in the course of which the examination of Bradley occurs, Professor Watson makes good use of the "organization view" of reality, as I have termed it for brevity's sake. The aim of his criticism is to show "that reality in its completeness must be a thinkable reality." "If it is meant that there is in reality something which cannot be made the object of thought, because it is unthinkable, I do not see what kind of reality this can be."

The argument is forcible, and, but for certain criticisms of limitation, it is, in my opinion, valid. It runs thus: If reality is, as a true psychology teaches, nothing apart from the mental construction or content itself which is said to be real, then there can be no room for Bradley's contention that the knowing or judging process always vitiates reality because it issues in a series of partial predications, none of which adequately expresses reality, and all of which are among themselves liable to contradiction. This is, it will be remembered, the road which Bradley takes to show that all knowledge is appearance and issues in *Schein.* Now, says Watson, such a reality, separated from the organized content of knowledge, is quite supposititious: the very meaning of reality is psychologically just the mental organization itself at the different stages attained by progressive conception and judgment. So Bradley's distinction between that which would be real if we could get hold of it, and that which is not real because we have got hold of it, is throughout a false distinction. The criticism is valid, as I said, as against Bradley's impeachment of judgment; but it is not valid as used by Professor Watson in his further positive contention that, if this be true, then reality must be capable of being thought, in whatever instance it be considered, and therefore, also, in the instance of the absolute. True as far as it goes, this latter view is inadequate psychologically, and proves in the sequel not only to leave other views open, but to allow a return to the essence of Bradley's contention. This I may take a little space to show.

A reading of the recent new-school Logics, — Sigwart, Bosanquet, Bradley, and above all the later disciples of Brentano, — show us that there is partial agreement in regard to the predicate "existence." This agreement

may be brought out in the light of the foregoing by saying that Professor Watson makes a simple conversion of a proposition which is (1), not universally true and is (2), not simply convertible. He says, in effect, mental constructions give us at once and *ipso facto* what we mean by reality; hence all reality must be construed as an actual or possible mental construction.

Taking the first member of the sentence first — it is not true as a universal. The Logics say differently; and this is just the value of the partial agreement they are effecting as against the older interminable disputes as to whether existence added anything, when thought in connection with an object, to the mere thought of the object. The Logics say in answer to this question: No, the thought of existence adds nothing to the object as merely thought. And this is the valuable contention which Professor Watson enforces against Bradley. But the Logics then go on to say further: The thought of existence is a different psychological mode, nevertheless, and finds itself quite a different psychosis. The thought of a thing as existing has the mode, or is the psychosis, which we call *belief;* and whatever it be that constitutes this "mode" different from that of the mere thought-content itself, it is a real difference which psychology must recognize. It is not all thought-constructions that carry the reality predicate; it is only some of them — Sigwart would say, only those which are (necessarily) so judged by us; Bosanquet seems to wish to say, only those which carry some sort of necessity other than the necessity with which sensations break in upon us. But whatever the lines of distinctions be, they must be lines drawn by something else than thought; since the content remains the same — to be believed to be real or not — and existence is not a thought-

predicate. The distinctions involved are really, in my opinion, distinctions of attitude, motived largely by differences of feeling.

Furthermore — to take up the second point — even if it were true that all mental constructions carried reality with them, still such a proposition could not be simply converted. There is a more primitive form of consciousness, a mode of dealing with content, which does not involve existence as a predicate, but which nevertheless suffices for our activities in the presence of realities. "Reality-feeling," as I have called it, precedes belief; and belief — the assertion of the reality-predicate — gives a return to the "reality-feeling" again, after a transition period of doubt, hesitation, suspension of judgment. Without taking space for going into points made elsewhere,[1] for the added reason, also, that they are in a measure my individual views, I may be content to put in evidence the fact that it is only part of the realities which we get that are thought-constructions; many of them are *felt* realities. For example, does not ethical appreciation always run ahead of cognitive description? The æsthetic and other "worths," of our system of realities, are as such not objects of thought.

If these points be true, how can we say that the absolute must, in virtue of psychological deliverances, be capable of being exhausted in terms of thought?

It would seem to be a competent statement, if we should modify the sentence, "Reality in its completeness must be a thinkable reality," of Professor Watson; and say: Reality in its completeness cannot be merely a thinkable reality; even though it be capable of being

[1] See my *Feeling and Will*, chap. vii. and the article "Feeling, Belief and Judgment" (from *Mind*, July 1, 1892), printed below in this volume.

thought, it must have in it the quality of moving the possible thinker in the way we call belief, ethical appreciation, etc.; and farther, it may be so simple a thing to the consciousness in which we are supposing the appeal to do the thinking about it to be made, that it cannot be adequately thought at all, but rests as to certain of its apprehended aspects, in its own limpid immediacy. This would seem to be the conclusion from the appeal to psychology, if Professor Watson insists on making it; and such a simple "given" would seem in a measure to justify Mr. Bradley's insight in calling it "that" as opposed to "what."

# V

## THE COSMIC AND THE MORAL

In his paper on "Natural Law, Evolution, and Ethics," in this[1] Journal (July, 1895, p. 489), my friend Professor J. Royce presents under the caption of "Discussion" an interesting attempt to reconcile the "cosmic" with the "ethical process," *apropos* of the current discussions raised by Mr. Huxley's much-talked-of address on *Evolution and Ethics*. The development given by Mr. Royce is based upon the well-known distinction between the "world of description," and the "world of appreciation" of the same author's work, *The Spirit of Modern Philosophy*. He also refers to the article of his on "The External World and the Social Consciousness" in the *Philosophical Review*, September, 1894. The currency already attained by these views of Mr. Royce makes it unnecessary that I should stop long on the preliminaries of his present paper.

Briefly, the argument is this: All the formulas of natural science are descriptions of phenomena which are held together just for the purposes of natural science. The growth of the thought of the objective is, genetically, the sorting out and grouping by these formulas of the items of experience which have two general characters: they are capable of "description," and also of "social verification." The description is necessary to their being statable as interconnected wholes or groups: the

[1] From the *Int. Journ. of Ethics*, Oct., 1895.

verification is necessary to their being the matter of science, *i. e.*, objectively there for the discovery of all men alike. The remaining contents of experience, not presenting these characters, are not thrown together under the statement of natural laws, or "cosmic process": they are capricious, in the sense that they are not describable; and they are subjective, in the sense that they are not verifiable. They are therefore set off over against the cosmic process: and when we come to see their character as involving desire, with certain ingredients of the desirable known as "the ideal," the opposition crystallizes into that of the "ethical" over against the "cosmic process." The distinction is, therefore, genetically one of the method and flow of experience; it does not seem to require a corresponding division or dualism in the nature of reality itself.

So far Mr. Royce's discussion seems to me to be very clear and, in its main contention, true. I think the distinction in consciousness, when genetically considered, between the two points of view of "description" and "appreciation" is the root of opposition between the cosmic and the ethical. I am not able, however, to accept his tests of the objective; and it may not be out of place, in view of the active discussions now going on, to examine his argument a little in detail.

In the first place, Mr. Royce seems, after getting consciousness into this dilemma of the necessary antithesis between the "ought" and the "is," to find no psychological way of getting consciousness out of it. He seems to say: "Remain a man of science and the moral sense is an illusion — remain a moralist and the man of science is a liar! No man can be both at once. The only way that a reconciliation can be effected is by a philosophy which still recognizes the opposition, it is

true, but is able to reinforce the statement of one side with profounder reasons." The ethical process it is that is reinforced in Mr. Royce's philosophy, and so the protest of the spirit is heard in the court of claims of ultimate reality. Science is tolerated, then, not justified ultimately.

Now this theory, it seems, does not "reconcile" the two processes; it merely gives us an interesting account of the genesis of the opposition. It seems to require, both in its account of the description of phenomena and in that of the meaning of desire, the same opposition between a unity which is merely recognized as given, and a unity which is demanded, although not given. Professor Royce leaves the desire urging on to something essentially indescribable and unverifiable. He says: "The object of our ideal is desirable *not* in so far as it is describable, and, again *precisely in so far as it is not yet verifiable* [italics his]. Herein, then, lies a double contrast between the natural fact as such, and the object of desire as such." With this account of desire we should expect failure to get any real reconciliation; for it confuses the "object" of desire with the fact that with the object there is what we call, very obscurely often, the accompanying sense of an ideal. But when we come *to distinguish between the object and this ideal accompaniment*, we see that the object is both describable and verifiable;[1] and then we see that through the attainment of it — if perchance we do attain it — we have brought the ideal which it stood for nearer to a similar construction. It, too, becomes now in so far also describable and verifiable; now not, however, as

[1] I have developed elsewhere (*Social and Ethical Interpretations*, 3d ed., 1902, sects. 242 f.) the distinction between "thing of fact" and "thing as object of desire."

ideal, but as fact. The sense called ideal still goes on to attach to a further object of desire. But inasmuch as by the successful pursuit of this object, then and there, we have so far realized our ideal, in so far we have turned the "ought" into the "is"; we have made natural history out of the objects of our ethical cravings. May not this suggest a real reconciliation of the two points of view, and not merely give an account of the opposition which remains to plague Professor Royce?

The sense of ought, then, from my point of view, is the anticipation of more experience, not yet treated under the rubrics of description; but so far as it is identified with any object of desire, so far it is thought to exemplify the canons of description of that object, as being most nearly the sort of experience that expectation is reaching toward. And natural science, the "cosmic process," *is the same series read backward.* It is experience fully described, and hence rid of that coloring of expectation and desire which, when it was looked at the other way, made it the vehicle for the realization of the ideal.

When we come to the metaphysical point of view we find the same criticism of Mr. Royce in order. What shall we say to a "reconciliation" which still, as I think, allows the two parties to the controversy each to establish his own side by cutting off half of consciousness and throwing it away? The positivist may say: "From profound philosophical reasons, I find consciousness justified in its descriptions; it is under illusion in its appreciations." And the idealist turns the tables, justifying himself also on profound philosophical grounds. The reason that they can do this is found in Professor Royce's failure to find an actual identity anywhere between the experiences described and the good desired:

instead of holding that the "is" is always, in so far, also the "ought" (that is, so far as it is the legitimate outcome of the cosmic process, *i. e.*, is statable universally, and is not a mere accident); but that, by the very movement by which consciousness gets it as an "is," it has to transcend it in a search for a further "ought." But if this is true, — if the series is one and the antithesis arises from the two points of view, "prospective and retrospective," from which it is viewed, — then a being who could hold both points of view adequately at once, would know no such opposition. He would "appreciate" the world as good without being under illusion, and also describes it as true without being a liar.

This inadequacy, as I venture to think it, of Mr. Royce's paper, may be brought out also by the consideration of one other point. We may ask how one is to meet the objection that in giving a natural history of the distinction between the "is" and the "ought" one lays himself open to the charge of giving exclusive weight to the "is" after all. The very sense of appreciation is itself a cosmic product; how then can it have any meaning apart from the details of history out of which it has arisen? This very dilemma seems to me to be the fruitful source of confusion in Mr. Huxley's Address. He treats the "ought" in the body of the Address as in essential opposition to the "cosmic is"; and in an appendix says it is nevertheless a variation which has been "selected."

But if the moral sense is due to selection, we may ask, must it not have existed as a fact, a variation, say, before it was selected? But if so, how can it as a fact have been in essential opposition to the series of facts which the theory of survival for utility presupposes? Now, I think Professor Royce's paper does not answer

this question. He seems to leave a gap between the sense of the thing and the sense of its value; he says, however, that the sense of value attaches to all things; and by making the essentially valuable aspect of the thing indescribable and unverifiable, he says in effect that it cannot be a natural history outcome.[1]

On the contrary, apart from details of natural history which I have discussed at length elsewhere,[2] I think the matter described by the "is" is the inadequate content of that which we feel "ought" to be; and the description of what "oughted" to be, *i. e.*, that which *was* the object of description of a past "ought," is what "is." In short, the "ought" is a function of a mental content, of a descriptive "is," — a motor function, I think, — and so like every other function of content has its own natural history as a single fact; but its meaning is progressive, prospective, and the discovery of its full meaning still remains a question apart from its origin and place in evolution.

I can say, therefore, with Professor Royce: "Novelty is a *conditio sine qua non* of all ideal value when regarded from a temporal point of view;" but I must add that novelty, as such, is not the only *conditio sine qua non*. Rather is the full fact what he calls in his context the "interestingly novel." For an object of desire there must be enough description to make the thing interesting; and this description is the thought content. Realize the desire, and you in so far add to the description, and so set another content for further desire. It is just this progressively built up content, viewed first from

[1] I know he gives it a natural history in the individual's private experience, but that seems to be, in a sense, apart from the cosmic movement. I have discussed this question in some detail in the paper on "Origin and Nature" cited below.

[2] See my *Mental Development*, pp. 341 ff.

the point of view of novelty, then from that of history, then from that of novelty again, that the final identity of reality must rest upon. An all-comprehensive experience would be appreciated as the all-good. So I say "nay!" to this sentence of our author: "There is no chance of reconciling the metaphysically real and ultimate universality of the so-called cosmical processes, or processes according to describably rigid laws, with any even remotely ethical interpretation of the same reality." Rather must reality, when viewed metaphysically, be both rigidly true and *also* divinely fair — so far as metaphysics may allow us to hold to either category as more than a device of human thinking.[1]

In conclusion, I do not think this is the only topic the discussion of which calls for a reconciliation of the same two points of view. I have developed, in a paper in the *Psychological Review* (Nov. 1895, "The Origin of a Thing and its Nature," reprinted in the volume *Development and Evolution*, 1902) a general distinction of "prospective" and "retrospective" points of view under which that between "description" and "appreciation" may be subsumed. In general, I may add that the distinction, genetically considered, is that which I have endeavored to set out *in extenso*, and in part from a biological point of view, under the terms Habit and Accommodation, in the work on *Mental Development*. Under these principles, respectively, the "is" and the "ought" find their genesis. And with this the main psychological position of Professor Royce is, I think, quite in harmony.

[1] This point embodies one of the essential approaches to the philosophy toward which the writer is now (1902) finding his personal views tending and which sees in the *æsthetic* category, rather than in either that of truth or that of ethical worth, the real and final reconciliation.

# VI

## PSYCHOLOGY PAST AND PRESENT[1]

### I. Historical

Modern psychology has had its principal development in Great Britain, Germany, and France. Germany has undoubtedly had greatest influence in this movement, considered in all its branches. The two main currents of development previous to the rise of the new so-called "scientific" psychology, designated as "speculative" and "empirical," had their initial impulse, as well as their fruitful pursuit, respectively in Germany and Britain. German psychology down to the rise of the Herbartian movement was a chapter of deductions from speculative principles; English psychology was a detailed analysis of the experiences of the individual consciousness. Kant, Fichte, and Hegel may sufficiently represent the succession in Germany; James Mill, John Stuart Mill, Hume, Reid, and Bain, that in Great Britain.

The work of Herbart and his school tended to bring a more empirical treatment into German thought, and

[1] In part, from *The Psychological Review*, July, 1894, being material prepared by the author (by request), in company with many others, in his capacity as "Judge of Award" for this subject, at the World's Columbian Exposition, for "A Historical and Educational Report," which the government failed to publish. The report pays especial attention to the development of psychology in the United States. Later historical matter will be found in the writer's *Dictionary of Philosophy and Psychology* under the various topics "Psychology."

its significance was twofold: it excited opposition to the speculative method, and it prepared the Germans for the results of English analysis. It is further a legitimate supposition that the spirit of experimental inquiry which has swept over Germany in this century was made more easily assimilable to workers in this department, also, by the patient and extraordinary attempt of Herbart in his *Psychologie als Wissènschaft* (1824) to construct a "mechanic" and "static" of mind.

To German thinkers also belongs the credit due to originators of all new movements which show their vitality by growth and reproduction, in that the experimental treatment of the mind was first advocated and initiated in Germany. But of this I write more fully below.

The contribution of France to psychology has been no doubt of less importance; yet the work of its writers has also illustrated a fruitful and productive movement. It has been from the side of medicine that French work has influenced current wide-spread conceptions of the mind. Mental pathology and the lessons of it for the theory of mental functions have come possibly most of all from France; or at any rate — not to disparage the admirable recent work of English and German investigators — the tendency, so to speak, of the French treatment of consciousness has been to approach mental operations from the abnormal side.

In America the influences which have tended to control psychological opinion have been mainly theological on one side and educational on the other. The absence of great native systems of speculative thought has prevented at once the rationalistic invasions into theology which characterized the German development, and also

the attempts at psychological interpretation which furnished a supposed basis of fact to the idealistic systems. In Germany various "philosophies of nature" sought to find even in objective science support for theoretical world-dialectic: and psychology fared even worse, since it is, *par excellence*, the theatre for the exploitation of universal hypotheses. But in America until recently men did not speculate much: and those who did were theologians. So naturally the psychologists were theologians also. Jonathan Edwards had a doctrine of the agent because free-will was a question of theology.

The educational influence has been auxiliary largely to the theological. The absence of great universities with chairs for research; the nature of the educational foundations which existed under denominational control; the aim of education as conceived in the centres where the necessity for supplying growing towns with pastors was urgent; the wholesome fact for our civilization that the Puritans had traditions in favor of the school and of religious education — all these things made it necessary only that books sound in their theological bearings, or affording homiletic lessons in living, should be written, in a topic of such central importance. Even the term "psychology" is only now becoming domesticated: "mental" and "moral" philosophy were the titles of courses of instruction on the "soul."

The type of philosophy which these conditions encouraged was, it may easily be imagined, realistic; and it is probably for the reasons which I have indicated that the Scottish Natural Realism was the American type of thought, and is now, except in the great university centres where systematic philosophy has become an end in itself apart from its duty to theology and educa-

tion. So far as psychology was concerned, this realistic tendency was a great good. It led to a magnification of mental reality, to a reverence for the "utterances of consciousness," to a realistic interpretation of the "immediate knowledge of self," to the firm settling of the great "intuitions," cause, time, space, God, etc.; and in so far as this led to the direct examination of consciousness and to the testing of philosophical claims by consciousness, it prepared the way for a better and broader method. This tendency is marked even in the more influential works in theology. Channing and Emerson no less than Smith and Charles Hodge lay the corner-stone of argument again and again in the proof "from consciousness."

This tendency to a psychological view of philosophy having its basis in the religious motive is seen also in Scotland, the home of realism: and it is there a part of the British method of thought which I have already spoken of. The works on psychology written in America up to 1880 were, as we should expect, from the hands of theologians and educators, usually both in the same person; for it is a further proof of the association of psychology and theology that the mental and moral philosophy in the colleges was almost without exception put in the hands of the president of the college, and he was by unanimous requirement a preacher. So were written a series of works which are landmarks of American scholarship, props of evangelical theology, disciplinary aids of the highest value to the growing student, and evidences — to revert again to my argument — of the two-fold influence I have indicated. Edwards's *Freedom of the Will* (1754), Tappan's *Review of Edwards* (1839) and *Doctrine of the Will determined by an Appeal to Consciousness* (1840), Hickok's

*Rational Psychology* (1848) and *Empirical Psychology* (1854), Porter's *Human Intellect* (1868) and *Moral Science* (1885), McCosh's *Psychology* (1887) and *First and Fundamental Truths* (1889) — these and other books like them show the psychology of America up to the decade beginning 1880. Speaking for psychology alone, it is easy to point out their merits and defects, not in my individual judgment, but as compared with the standards of the present year of the Exposition (1893). It is necessary, however, rather to show this by sketching the present and showing the new elements which have modified American work and whence they came.

Coming to the present state of psychological thought, my task is made easier by reason of the divorce which has been forced between psychology as a science on the one hand and metaphysics on the other. As was said above, Herbart, while failing in his attempt to apply mathematics to mental "permutations and combinations," yet prepared the way for a new treatment of mental phenomena. After his attempt it began to be seen that the facts of conscious life were first in order of importance and were capable of treatment in a detailed way quite independently of the questions of Being, the Absolute, and the like.[1] The works of Volkmann, *Lehrbuch der Psychologie* (4th ed., 1894), and Lipps, *Dei Grundthatsachen des Seelenlebens* (1883) illustrate this.

This was only to begin to do what had been doing in England since Locke. But the Germans now went further: they asked the question — which had been groped upon before by Descartes, by Leibnitz, and by Reid — how can psychology be a science when one of

[1] The reader may refer to the article on "Herbart and Herbartanism," by Stout, in the writer's *Dictionary of Philosophy* (1901–2).

the evident conditions of the flow of mental states, of their integrity and their trustworthiness, the brain, is left quite out of account? What is the law of connection of mind and brain? And is it possible to modify the brain and so to modify the mind? If so, then that great instrument of scientific work, experiment, may perform a part for the psychologist also, and his resources may thus be magnificently enlarged.

This is the question of Experimental Psychology. It was answered in Germany in the affirmative. Lotze, in my view, deserves the credit of it, the credit of the great-minded constructive pioneer; and Wundt is the founder of the science in the sense that he first realized the expectations of Lotze's genius by actually planning and executing experiments on a large scale which made the affirmative answer an irreversible fact of history. Lotze's *Medicinische Psychologie* appeared in 1852, Wundt's *Grundzüge der Physiologischen Psychologie* in 1874. Between the two, however, came Fechner, whose theoretical construction of the new work and its methods shows all the exactness of treatment of similar discussions of natural-science principles by physicists and chemists, and published the formulas in which he attempted to give universal statement to the discoveries of E. H. Weber on the intensity of sensation-states. Fechner's *Elemente der Psychophysik* appeared in 1860.

Apart from its actual development this new method has profoundly modified the general conception of psychology even where its validity as a method has been denied. There has been nothing less than a revolution in the conception of psychology since the publication of the works just named. One of the motives of this

revolution thus came from Germany. The other — for it has two great phases — is due to English thinkers: the evolutionists, of whom Herbert Spencer (*Principles of Psychology*, 1855) was a pioneer. These two influences are seen in two great points of contrast easily made out between the psychology of to-day and that of yesterday in America. The latter I have described above: its two main characteristics, for purposes of the present contrast, are first, its character as so-called "faculty-psychology"; and second, its character as holding to what I may call a "ready-made" view of consciousness — technically an "intuition" view of consciousness. In opposition to these characters, current psychology is "functional" — holding to mental "functions" rather than to mental faculties; and finds these functions to be "genetic" rather than intuitive — the functions "grow," instead of being "ready-made."

The old conception of "faculties" made the different phases of mental process in large measure distinct from one another. Memory was a "faculty," a "power" of the mind; thought was another, imagination a third. The new functional conception asks how the mind as a whole acts, and how this one form of activity adapts itself to the different elements of material which it finds available. The old terms "memory," "thought," etc., are retained; but with the distinct understanding that they do not stand for divisions in the mind, or different processes, one of which may be held in reserve when another is acting, etc. On the contrary, the process in consciousness is one; and it is a psycho-physical process as well. The particular way in which this one function shows itself is a matter of adaptation to the changing conditions under which the activity is brought about. This transition is due in part also to the insight of

Herbart, and in part to the demand for unity insisted upon by the evolutionists.

The other point of contrast is equally plain. The "genetic" point of view in current discussion is opposed to the older "intuitive" point of view. The mind is looked upon as having grown to be what it is, both as respects the growth of the man from the child, and as respects the place of man in the scale of conscious existences. The understanding of mental facts is sought in the comprehension of their origin as well as their nature; and the question of the validity or worth of "intuitive" beliefs in consciousness is subordinated to the question as to how the mind came to have such beliefs.

Both of these points of contrast have been further defined by the progress of general philosophy in America. The demand for unity in mental interpretation has not come from naturalistic evolution alone (John Fiske, *Outlines of Cosmic Philosophy*, 1874; Thompson, *System of Psychology*, 1884); an equally pressing demand has come from idealistic metaphysics, which seeks for continuity in the series of animal minds as zealously as does the advocate of evolution. The influence of Hegel, as interpreted in the works of Green, and later in those of Caird, has been potent in effecting this transformation here. It is easy to see also that the same union of forces is quite feasible as respects the genetic development of the individual consciousness; yet the new idealists have not done justice to this growing tendency in modern psychology, no doubt for the reason that idealism is based largely upon the analysis of the adult human consciousness.

The line of cleavage, in the current discussions of general psychology, is drawn through the question of the

interpretation of mental "function"; both sides claiming the same full liberty of genetic research and the same resources of analysis and experiment. The "Associationists," on the one hand, carrying on the tradition of the British empiricists, construe mental function after analogy with the interplay of physical forces in the objective world; the "Apperceptionists," on the other hand, hold that mental function is in form an irreducible sort of process. Apart from original monographs on special topics, no work on psychology to-day commands much attention from general psychologists or from students of philosophy, which does not show itself alive to this main issue. The works of Lotze and Wundt have had great influence in America in the direction of this general statement of this problem in psychology; and it is especially the philosophy of Lotze which has been influential in replacing by a reasoned and critical philosophy the earlier theological dogmatic realism so long prevalent in the United States by inheritance from Scotland.

On the literature of experimental psychology I can do no better than quote the following passage freely translated from the most recent[1] German work on general psychology, itself fully representative of the present state of knowledge — *Grundriss der Psychologie*, by Professor Külpe of the University of Leipzig (pp. 27 ff.):

"About the middle of the nineteenth century experimental and psycho-physical psychology began its course in Germany. While Herbart recognized a threefold influence of the body upon the mind, . . . it was Lotze who made a thorough beginning in the employment of the data of physiology. Lotze, indeed, began his work

[1] That is, when this was written.

with certain metaphysical expositions after the manner of the older German writers, and is very far from the recognition of a universal psycho-physical parallelism. But he does not hesitate to speak of the nervous conditions of mental processes, and he had the good fortune to suggest hypotheses of value where exact knowledge was wanting. The real foundation of Experimental Psychology was laid, however, by G. T. Fechner, who sought to carry out in a thorough-going way the conception of a functional relation between mental and physical processes. Although the mathematical form which he gave to this relation . . . does not hold, yet he gave to the exact science of psychology an extraordinary impulse, by reason of the new conceptions which he introduced, the methods of procedure which he both formulated and applied, the working over which he gave to the material he had in hand, and the observations and researches which he himself carried out. . . . The union of the experimental and psycho-physical was finally accomplished by Wilhelm Wundt . . . in his classical *Grundzüge der Physiologischen Psychologie* (1874, 4th ed., 1893). By this unity of conception and by his comprehensive treatment of all mental phenomena . . . he has made the current phrase 'new psychology' applicable. . . . Wundt gave a further important impulse to the cultivation of experimental psychology by founding the laboratory at Leipzig in 1879, and establishing the *Philosophische Studien*, a journal devoted mainly to the publication of researches from his institute.

"Additional works may be mentioned of very recent date, which must be reckoned in their character as belonging to the modern psychology thus founded by Wundt, although they differ more or less essentially in system and in theory from him and from one another:

Höffding, *Psychologie in Umrissen*, 2d ed., 1893, German translation from the Danish (English translation, 1891); Ladd, *Elements of Physiological Psychology*, 1887; Sergi, *La Psychologie Physiologique* (translation from the Italian, 1888); W. James, *The Principles of Psychology*, 1890; Ziehen, *Leitfaden der physiologischen Psychologie* (1891; 2d ed., 1893); Baldwin, *Handbook of Psychology*, 1891 (2d ed.; 1st ed., 1889–90); J. Sully, *The Human Mind*, 1892.

"We may mention also certain periodicals which represent the same current of psychological thought: *Philosophische Studien*, edited by W. Wundt (1883 ff.); *The American Journal of Psychology*, edited by G. S. Hall (1887 ff.); *Zeitschrift für Psychologie und Physiologie der Sinnesorgane*, edited by H. Ebbinghaus and A. König (1890 ff.)."

The part taken by American students in the present psychological movement is seen in the fact that of the seven works thus cited by Külpe three are by Americans, and to them must be added *Psychology: Descriptive and Explanatory* (1894), by G. T. Ladd, and the journal *The Psychological Review*, edited by J. McK. Cattell and J. Mark Baldwin (1894 ff.). Another important French work of recent date is *La Psychologie des Idées-Forces*, by A. Fouillée (1893).[1] The position of psychology in the American colleges and universities is described in a further section below.

Other important contributions to Experimental Psychology — apart from the long series of monographs and research articles published in Germany and America

[1] Other later general treatises are Stout, *Analytic Psychology*, and *Manual of Psychology*; Ebbinghaus, *Psychologie* (Bd. I.); Jodl, *Lehrbuch der Psychologie*; Titchener, *Experimental Psychology*; Münsterberg, *Grundzuge der Psychologie* (not, however, an exhaustive list).

— are Helmholtz, *Physiologische Optik* (1867, 2d ed., 1886, French translation), and *Tonempfindungen* (1863, English translation); Stumpf, *Tonpsychologie* (1883–90); and Münsterberg, *Beiträge zur experimentellen Psychologie*, Parts I–IV (1889–93).

The contribution from the side of mental pathology has become important on account of the *rapprochement* which has obtained in recent years between the alienist and the psychologist. The works of Pierre Janet, *Automatisme psychologique* (1889) and *L'État mental des Hystériques* (1892–93),[1] and of Bernheim, *Suggestive Therapeutics* (English translation, 1889), and *Études de la Suggestion* (1892), are most important. To them should be added the works of Ribot, *Diseases of the Will*, English translation (5th French ed., 1888); *Diseases of Memory*, English translation (5th French ed., 1888); *Diseases of Personality* (2d ed., 1888; English translation, 1891), together with the many original contributions on the subject of hypnotism and aberrations of personality published in the *Revue Philosophique* (edited by Th. Ribot, vols. I–XXXVI, 1876 ff.) and summed up in part in *Les Altérations de la Personalité* (1893; Eng. trans. 1896) of Alf. Binet.

Further, the treatment of psychology in accordance with the British tradition, from the point of view of description and analysis, has been carried forward by Ward in the article "Psychology" in the Encyclopædia Britannica, 9th ed. This type of research has also had its organ of publication in *Mind: a Journal of Psychology and Philosophy*, edited by G. Croom Robertson (vols. I–XVI, 1876 ff.) and by G. F. Stout (New Series 1892 ff.).

Finally, the genetic treatment of consciousness has

[1] Eng. trans., 1901; see also the later work *Névroses et les Idées fixes.*

been advanced by the works of Spencer, *Principles of Psychology*, 1855 (3d ed., 1880); Romanes, *The Origin of Human Faculty*, 1884–1888; Lloyd Morgan, *Animal Life and Intelligence* (1891);[1] and Galton, *Inquiries into Human Faculty* (1883) and *Natural Inheritance* (1889).

## II. The Method and Main Divisions of Experimental Psychology

To say that this is the age of science is only to repeat what is now trite and what no student either of philosophy or of history needs to be told. It is the age of science because it is the age of devotion to science and of results in science. But it is a very different thing to say that this is the age of scientific method. Former ages have seen devotion to science and results in science, but I venture to say that no former age has, as an age, realized a scientific method. So prevailing, however, has the new method now become, and so customary to us, that it is only by historical study that we are able either to see that it is new, or to work ourselves into that degree of intellectual sympathy for the old which the earnest endeavor and unflagging patience of the heroes of philosophy in the past rightfully demand for all time.

In characterizing our time by the word "scientific," as regards method, I mean to say something which is true in philosophy, politics, literature, as well as in the investigation of nature; and to dwell only on the department of thought in which such a method has been, and is, most difficult to realize. In philosophy

[1] And later, *Habit and Instinct* (1896). Here also belong the present writer's works dealing with *Mental Development* (3 vols.).

it is not fully realized; and yet I believe that any class or school of philosophic thinkers who do not face toward the scientific east are steering up-current and will be absent when science and philosophy enter a common barge and together compass the universe of knowledge. For it is a part of the same conviction as to scientific method that neither science nor philosophy will ever succeed in compassing it alone. However painfully this advance may have been won and however loudly the dogmatists may deny its justification, it is sufficient here to signalize the fact that philosophy has in the present half century thrown open her doors to the entrance of critical and empirical methods, and that the results already accruing are evidence of the bigness of her future harvest.

In general philosophy what has been called scientific method is better known, as I have said above, in a two-fold way, as empirical and critical. Retrospectively what we now have to rejoice in in philosophy is due about equally to two traditions, represented by Hume and Kant. The burden of current idealism, as far as it is worthy of consideration in our time, is to purify and conserve the work of Kant. And the burden of empiricism, under the same restriction, is to construct science within the domain claimed for it by Hume.

In psychology the modern transformation comes most strongly out. Here we find an actual department of knowledge handed over to a new class of men for treatment, so remarkable is the demand for scientific method. It is no longer sufficient that a psychologist should be familiar with general philosophy and its history, or capable of acute logical criticism of systems; it is necessary, if he would deal successfully with the new problems and gain the ear of the advanced philoso-

phical public, that he should reason from a basis of fact and by an inductive procedure. In short, he must not bring his philosophy as speculation into psychology, but must carry his psychology as fact, in its connection with physiology, anthropology, etc., into general philosophy.

To illustrate this change, and its effect on general theories, recent discussions of the idea of space may be cited in comparison with the earlier and more speculative treatment. The reasonings of James, Wundt, Bain, Spencer, differ so essentially from the argumentation of Kant and earlier men that it is almost impossible to find common ground between them. No one among those who accept Kant's results depends in our day very largely upon his reasons; the question is shifted to another field. The physiologist has as much to say about it to-day as the psychologist, and the speculative philosopher has to recognize them both.

This tendency of the day in philosophy may be expressed by a chemical figure as a "precipitating" tendency. We are endeavoring, and successfully too, to throw all questions which are capable of such treatment to the bottom, as a precipitate — a psychological precipitate — and are then handing them over to the psychologist for positive treatment. As long as our data remained in a solution of ninety parts water (which, being interpreted, means speculation), it was difficult to handle them scientifically. While admitting the utility and necessity of ontology in its place, current psychology claims that its place must be better defined than formerly it has been, and that whenever we can secure a sediment, a residuum, a deposit, apart from a speculative solvent, this is so much gain to positive science and to truth.

One of the ideas which lie at the bottom of the so-

called "new psychology" is the idea of measurement. Measurement, determination in quantity and time, is the resource of all quantitative science, and as long as such a resource was denied to the psychologist he was called a scientist only in his function of description and classification. And the justification of the application of measurement to psychological facts has come, not from theoretical considerations — for they were all opposed, and still are, in many of the books of the new idealism — but from practical attempts to do what philosophy declared to be impossible. That is, experiment has been the desired and only "reagent." It is true that theoretical justifications are now forthcoming of the application of experiment to consciousness, but they are suggested by the actual results and are not in sufficient currency to counteract the influence of Kant's ultimatum, for example, that a science of psychology was impossible.

By experiment in this connection is meant experiment on the nervous system with the accompanying modifications it occasions in consciousness. Efforts have been made in earlier times to experiment upon states of consciousness directly. Descartes deserves credit for such efforts, and for the intimation he gives us, in his theory of emotions, of an approach to mind through the body. But the elevation of such an approach to the place of a recognized psychological method was not possible to Descartes, Kant, or any one else who lived and theorized before the remarkable advance made in the second half of the xixth century in the physiology of the nervous system. And even as it is, many questions which will in the end admit of investigation from the side of the organism are still in abeyance till new light is cast upon obscure processes of the brain and nerves.

A little further reflection will show us that the employment of experiment in this sphere proceeds upon two assumptions which are now generally admitted and are justified as empirical principles, at least by the results. They are both assumptions which the physical scientist is accustomed to make in dealing with his material, and their statement is sufficient indication of their elementary importance, however novel they may sound to those who are accustomed to think and speak of mind as something given to us in entire independence of organic processes. The first of these assumptions is this: that our mental life is always and everywhere accompanied by a process of nervous change. This is seen to be necessary to any method which involves the passage of mind to body or the reverse by the interpretation of effects. Which is cause and which effect, the mental or the physical change, or whether they both are effects of an unknown cause, is immaterial — to consider such a question would be to introduce what I have called the "speculative solvent." It is sufficient to know that they are always together, and that the change in one may be indicated in symbols which also represent the change in the other. The second assumption is based upon the first, it is that this connection between mind and body is uniform. By this is meant what in general induction is called the uniformity of nature. Any relation sufficiently stable to admit of repeated experiment in the manipulation of its terms is in so far uniform. Experiment would be useless if the relation it tends to establish were not stable, since the result of one experiment would give no antecedent likelihood as to the result of others under similiar circumstances. Experimental psychology, therefore, rests upon the assumption that a relation of correspondence

— be it co-existence or causation — once clearly made out between a mental and a nervous modification, it must hold good under any and every repetition of the same experiment under the same conditions.

These two assumptions made, we have at once the possibility of a physical approach to the facts of consciousness. The result is a relative measurement of such facts in terms of the external stimulation of the nerves, in regular and normal conditions of the activity of attention.

Further, it is apparent that such a means of experimentation may become available either under artificial or under natural conditions, according as the nervous stimulation is due to an external excitation, or arises from some unusual condition of the organism itself. All cases of brain or nervous disease, on the one hand, offer opportunities for boundless observation; the mental functions showing changes due to the organic disturbances of disease. Here nature has arranged and actually performed the experiment for us; the only difficulty being the physiological one, that the cerebral states may be as obscure as the mental states which they are used to explain. All such cases of mental changes due to internal organic changes are classed together under the name of Physiological Psychology. It includes all questions which relate to nerve physiology and pathology, illusion, hallucination, mental disease, hypnosis, etc.

On the other hand, experiments may be arranged for the normal stimulation of the sense-organs — skin, muscles, special senses — under artificial conditions, as explained in part below. This is Experimental Psychology. On these lines modern scientific psychology falls into two great departments. As the normal prop-

erly precedes the abnormal, it is well to consider the line of researches based upon external experiment, confining ourselves to a more or less cursory view of results of historical interest.

## III. Psycho-Physics

In attempting to give a succinct account of the growth and main results of what we have called external experimental psychology, we must forewarn the reader that it is with very modest, and, it may be, minor facts that we are concerned. But this is a characteristic of the new method. Any fact in natural science is valuable for its own sake; and it is only after there has been a vast accumulation of such facts, that broader principles may be inferred from them. The problems we are called upon to consider are such preliminary applications of experiment, and their full value for mental interpretation is only now beginning to be apparent.

We have already stated that the two conceptions of quantity and time, or duration, may be made applicable to facts of consciousness, thus giving us means of relative measurement. According as we are dealing with one or the other conception — according as we are aiming at determinations in quantity of sensation, or in the duration of mental states, we may class experiments under two great divisions. All investigations into the quantity or intensity of sensations, go to constitute *Psycho-physics*, and all which aim at time determination go to make the department of the science called *Psychometry*.[1] Both of these branches of inquiry, it should be borne in mind, deal with the normal consciousness through simple excitations of the sense organs.

[1] Now more properly known as mental Chronometry.

Psycho-physics deals with the measurement of the intensity, as it is popularly called, the quantity or mass, as the psychologist uses the words, of sensation. The conception of intensity needs no further explanation: it is simply the difference between the light of one candle and of two or more, the sound of a bell near and far. It is a property of all sensation. The problem which presents itself is to reach a formula for such intensities in terms of the amount of stimulus required at the end organ to produce a given increase or decrease in conscious intensity. To illustrate, suppose a candle illuminates my page to a certain extent; how many candles would illuminate it enough to enable me to see twice as distinctly, or as distinctly at twice the distance? Is there any general law of the ratio of intensity of external stimulus to intensity of internal sensations, which will hold good for all the senses? Or is there a different law for each of the senses? Or again, is the entire case simply a matter of subjective estimation, varying with the mental and bodily conditions of the individual?

These questions were at one time hotly discussed, but have now been practically answered by the establishment of a single law of relation between stimulus and sensation, which holds good for those of the senses found to be most easily accessible, has been partially proved for other classes of sensations, and is under judgment in default of sufficient experimentation for a remaining group of sense-experiences. Before entering more particularly into details, however, it is well to define and explain several terms of current use among physiological psychologists.

By *excitation* (or stimulus) is meant the external force which excites a sense organ, whether it be of suffi-

cient intensity to produce a sensation or not. The feeblest sensation which we are able to experience or feel from any sense is called the *perceptible minimum;* the theoretical point at which such a sensation, when further enfeebled, disappears from consciousness, is the *threshold of sensation;* and the amount of excitation which is just sufficient for the perceptible minimum of sensation, is the *threshold excitation* for that sense. For example, air vibrations are the excitation for sensations of sound, the feeblest sound which it is possible to hear under determined conditions is the perceptible minimum, and the number of units agreed upon — bells, tones, etc., — which are needed to produce this perceptible minimum makes the threshold excitation for this sense. Further, the amount of excitation needed to raise or lower the intensity of a sensation by the smallest amount which can be distinguished and the corresponding difference in the sensation, are called the *smallest perceptible difference* in excitation and sensation respectively. Thus, if 1 unit be the threshold excitation for sound and an addition of $\frac{1}{3}$ unit is necessary to produce any perceptible increase in the sensation, then $\frac{1}{3}$ is the smallest perceptible difference of excitation for sound.

With these definitions in mind, we may turn to the problem of finding a law of measurement for intensities of sensation. The preliminary question as to a standard of measurement is already answered in the resort to experiment, viz., the standard must be a scale of excitation values, determined by physical measurement, as pounds, velocities, etc., etc. Given a threshold value of each excitation, we may double, treble, . . . it, endeavoring to find some law of increase in the corresponding sensations whereby a corresponding internal scale may be erected. The first step is seen, therefore, to be the discovery of

the perceptible minimum of each sense, which may serve as zero point on the sensation scale, its exciting stimulus being the unit point on the excitation scale. This brings the investigator to an actual research on all the sense organs in turn — experiments to determine the minimum of sight, hearing, touch, etc. The methods by which this is done are simple. Any device by which excitation may be lowered or heightened gradually below or above the threshold may serve the purpose. For touch and the muscular sense small balls of cork may be used — differing so slightly in size that when placed, say on the back of the hand in succession, the difference between the last one which is felt, and the next which is too light to be felt, is as small as possible. By running the series in the reverse order, from weights too small to be felt to others barely felt, and by an equation and average of errors, the point is determined where the excitation produces the smallest perceptible sensation.

As simple as this procedure seems, the conditions are so complicated in some of the senses as to occasion great embarrassment. The eye, for example, is found to have a "natural light" of its own, arising from mechanical movement, friction, or chemical action, from which it is never entirely free, and the smallest perceptible sensation of light must always include this natural factor. The conditions of the body before the experiment also cause great variations, as is seen in experiments on temperature and smell sensations. The threshold value for temperature is much higher or lower, for example, according as the earlier state has been one of higher or lower temperature. The following table exhibits the results of Fechner's historical experiments on the perceptible minimum:

| | Perceptible Minima |
|---|---|
| Touch . . . . | Pressure of .002 — .05 gr. |
| Muscular Sense . | Contraction of .004 mm., right internal muscle of the eye. |
| Temperature . . | $\frac{1}{8}$° Centigrade (normal heat of skin 18.4°). |
| Sound . . . . | Ball of cork 1.001 gr. falling .001 m. on glass, ear distant 91 mm. |
| Light . . . . | Cast on black velvet by standard candle distant 8ft. 7in. |

Space does not permit an examination of each of these determinations, and it is not necessary; for the actual numerical values are not of great importance. The fact that there is a minimum under normal conditions and its determination with sufficient accuracy to give ground for further inferences, is all that the theory requires. For that reason we pass on without giving other and later results, even where Fechner has not been confirmed by other experimenters.

So far we have gained two points, *i. e.*, the zero on the sensation scale and the unit value, a positive known quantity from the table above, on the excitation scale. We now cast about for means to graduate both scales in an ascending way by relatively equal values.

It is a common fact of experience that excitations and sensations do not apparently sustain the ordinary relation of cause and effect to each other. Two candles do not illuminate a page twice as much as one; two violins, pitched in the same key do not double the sound of one; and as intensities increase, it is a matter of ordinary observation, that very little variations are brought about by well marked changes in the stimulus. This result of general observation recurs to us as we advance in the consideration of the values on our scales, for we would expect from this rough judgment of daily life, that larger increments would have to be made the higher we

ascend on the excitation side to produce regular equal increments on the sensation side.

This is confirmed by a further research undertaken on all the senses in turn, an experimental determination of the amount of increased excitation necessary to produce the *least noticeable difference* in sensations of the same kind. Let us suppose a given excitation for pressure, then increase it slightly until it is judged greater than before, determine the ratio of the increment to the former excitation, repeat the experiment with a much larger excitation, making the same fractional determination and compare the results. It is found that the fractional increase in excitation necessary to produce a perceptible difference is constant for each sense. But this means that the absolute increase is not constant, but becomes greater as the intensity of the initial excitation grows greater. For example, if the initial excitations in two experiments be 6 and 9 grammes, a relative fractional increase of $\frac{1}{3}$ would be in one case an absolute increase of 2 and in the other of 3 grammes.

There are three general methods of determining the smallest perceptible difference for any sense, due in their formal statement and description to Fechner. I shall state these methods briefly in view of their importance in any work of this kind. They are known as the methods, 1. of *least noticeable difference*, 2. of *true and false cases*, and 3. of *mean errors*. There is a fourth, of especial importance in researches on sight, called that of *mean gradations* (Plateau); but it is not necessary to speak of it further here.

1. *The method of least noticeable difference* is most direct. It consists in adding to a given excitation until the difference is barely perceived. The difference between the initial and the resulting excitation is the first determination of the quantity required. A plainly-

perceived difference is then added to the same initial excitation, and reduced till no longer perceived. This gives a second determination. The averaging of these two results is the correct value, which we may call DE, (difference or differential of excitation). Its ratio to the first excitation is expressed by the fraction $\frac{E}{DE}$. The relative degree of sensibility for any sense, it will be observed, is inversely proportional to the amount of excitation required to give the smallest perceptible difference in sensation, *i. e.*,

$$S\ (\text{sensibility}) = \frac{DE}{E}.$$

2. *The method of true and false cases* consists in comparing two excitations (say weights), the subject of the experiment judging them to be equal or not. The number of true and false judgments is recorded and the ratio between them indicates the approach of the difference of excitation to its minimum value. The relative sensibility again varies, as the actual difference between the excitations varies, and also directly as the number of true judgments (in relation to total cases), *i. e.*,

$$S = E\,\frac{S\ (= \text{total cases.})}{N\ (= \text{true cases.})}$$

3. *The method of mean errors* consists in comparing two stimuli (weights, etc.) and judging them equal, then in taking their real difference, positive and negative, in a great number of cases, adding these differences without regard to signs, and dividing by the entire number of cases. The mean error is thus arrived at. The sensibility is inversely proportional to the mean error, *i. e.*,

$$S = \frac{1}{D}.\ (= \text{mean error.})$$

Proceeding by one or all of these methods, we establish the smallest perceptible difference of excitation for each of the senses. The following table gives these values as they are now established, subject to revision for certain classes of sensation, especially sight, when the conditions of experiment can be made more free from error:

| | Least Noticeable Difference |
|---|---|
| Touch | $\frac{1}{3}$ |
| Muscular Sense | $\frac{1}{17}$ |
| Temperature | $\frac{1}{3}$ |
| Sound | $\frac{1}{3}$ |
| Light | $\frac{1}{100}$ |

The values given, it may be well to repeat, represent the amount of a given excitation which must be added to that excitation to be felt in consciousness. For example, if the eye is already stimulated by a light which represents 1,000 candles, at least 10 candles (a fractional increase of $\frac{1}{100}$) must be added to produce any perceptible increase in the intensity of the light. Any number less than ten could have no effect on consciousness whatever. And so with the relative values given for the other senses.

Now to revert to the problem which originally concerned us, — it will be remembered that the two determinations already arrived at for all the senses are only steps in a process of measuring the intensity of sensations in terms of external stimuli. So far we have determined the smallest perceptible sensation (giving us the starting points on our scale) and the smallest perceptible differences of excitation as we proceed upward in the graduation of our scale. The results of this second research may be stated in general language thus: *in order that sensation may increase by successive equal*

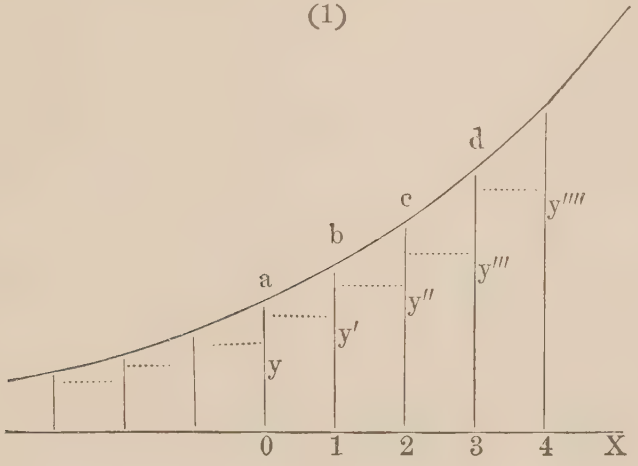
*additions, their excitations must increase by a constant fraction of the excitation itself, i. e.*, by additions which are not equal, but which increase as we ascend the scale of intensities. For example, the successive additions to a sound, to be barely perceived would require the following series of additions to the stimulus:

$\frac{1}{3}, \frac{1+\frac{1}{3}}{3}, \frac{1+\frac{1}{3}+\frac{1+\frac{1}{3}}{3}}{3}$, etc., or $\frac{1}{3}$, $\frac{4}{9}$, $\frac{16}{27}$, etc., and the actual excitations would be the series:

$$1, \frac{4}{3}, \frac{16}{9}, \frac{64}{27}, \text{etc.}$$

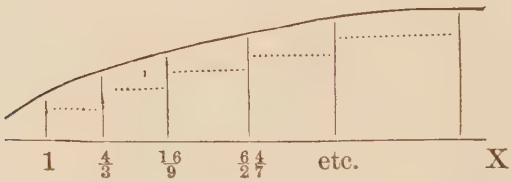
This general principle is called the Law of Weber, and may be stated in a variety of ways, of which, perhaps the easiest to remember is this: that in order that sensations may increase in intensity in an arithmetical series, their excitations must increase in a geometrical series. The law may be exhibited in a linear way to the eye in the following diagram (1):

(1)



Let X represent a series of sensations 0, 1, 2, etc., increasing by a constant quantity from the zero point 0; let the upright lines represent at each point the excitation necessary for the sensation of that intensity. Now by drawing the dotted lines parallel to X, it is seen that the succession additions made to the vertical are not equal, but grow constantly greater, *i. e.*, for hearing, $y' = y + \frac{y}{3}$, $y'' = y' + \frac{y'}{3}$, etc. Having erected these vertical lines by the law of increase given in the table, the curve abcd, etc., may be plotted through their extremities, being the "curve of excitation."

(2)




The same relation may be shown in an inverse way, in (2) above, in which the scale of increasing excitation is given on the line X, the vertical lines representing the sensations increasing by a constant quantity. The curve connecting the extremities is now the "curve of sensation," and is the obverse of the preceding.

A further mathematical expression has been given to this law by Fechner. As we shall see below, it is open to some criticism; yet it is ably defended, and whatever may be its fate as a mathematical deduction, the law of Weber as given above will not be involved.

Assuming, says Fechner, that the smallest perceptible differences in sensation are equal for any value of the

excitation (an assumption which has no proof), and that very small increments of sensation and excitation are proportional to each other, we may throw Weber's formula into the following equation (DS being increment of sensation, DE increment of excitation, and K merely a proportional constant):

$$DS = K \frac{DE}{E}$$

in which all the quantities have been determined in the tables already given. Now considering this a differential equation, we may integrate by our calculus and reach the form:

$$S = K. \log E, \text{ or}$$

*the sensation varies as the logarithm of the excitation,*— the celebrated logarithmic law of Fechner.

Considered under its more general form, as indicated in the principle of Weber, this law has an unequal application to different sensations. For sight, touch and hearing, it is fully established; for taste and smell, it is still in doubt, by reason of the mechanical difficulties which these senses offer to experimental research. It applies under restrictions to our estimation of linear distance, to our perception of the passage of small periods of time, and to our discrimination of local positions on the skin. In all cases, however, its application is restricted within upper and lower limits of intensity of sensation. When too intense, the organism fails under the stimulus, reaching the limit of its normal responsiveness, and when too faint, either the stimulus does not excite a conscious reaction, or the attention fails to discriminate the sensation.

With so much in the way of exposition of Weber's law before us, it may not be out of place to indicate the

principal criticisms which have been urged against it, both in its general result and in the method of research which it involves. To say that it has been criticised is to express very mildly the state of discussion which the last twenty years have seen, especially for a period after the publication of Fechner's great work.

Both of the two assumptions made by Fechner, that the perceptible differences of sensation of the same sense are equal for all intensities of stimulus, and that the increments of sensation and excitation are proportional, are called in question. The results of late physiological work tend strongly in favor of the first assumption and it is probably safely established. The second, with the application of the calculus of differentials, is so plainly subject to criticism that even its strongest advocates only attempt to justify it by the results. Really it is only infinitely small quantities that we are able to consider differentials or proportional to each other; while by the law of growth, arrived at by Weber, they are shown not to be proportional. This argument, adverse to Fechner's formula, is ably presented by Delbœuf. Another objection is brought, also, to the doctrine of "threshold." It is claimed that there is not a constant threshold for any of the senses, but that the minimum of sensation varies with the condition of the organism, the concentration of attention, etc. If this criticism should be shown, however, to be valid, it might still be possible to establish a table of variations or a co-efficient of "personal equation" for individuals, and still preserve the principle of Weber. The objection formerly drawn from the fatigue of the organ under prolonged experiment, is now met by the principle called by Fechner, the "parallel law": if we perform the experiments at very close time intervals, we may consider the degree of exhaustion as approxi-

mately the same for any two successive excitations. Any modification, therefore, which either excitation undergoes from the element of fatigue, is corrected in the ratio between that and the other excitation. For example, the smallest perceptible difference DA above an excitation A, reached by adding a new excitation B, is expressed by the fraction $\frac{B}{A}$: but any modification which affects both B and A to an equal degree does not alter their ratio.

The objection that Weber's law is as yet of very limited range loses its force in the presence of recent work. The senses to which it applies are the most accessible; but efforts are every day more successful in making the apparatus of experiment available also for the more complicated sensations. It should be remembered that all research involving physiology requires patient and prolonged experiment; indeed it is remarkable that so much positive work has already been done in this connection.

The philosophical significance of Weber's law is the ground of main interest to us. That it is an established law of the relation of mind and body as respects sensation, that it confirms the general assumption that there is a universal and uniform connection between the mental and the physiological — these points we are constrained to admit, whatever be our more particular interpretation of the law itself. As to its meaning for our theory of the mind, and whether it has any such meaning, there is more room for difference of opinion, and three distinct interpretations are commonly held among psychologists. Each of these is advanced in answer to the question which Weber's law obviously suggests, *i. e.*, why does not the direct relation of cause and effect

hold between sensation and excitation: why is sensation proportional to the logarithm of excitation and not to excitation itself?

The first of these interpretations, that of Fechner, is that Weber's law represents the ultimate principle of connection between mind and body: that they are so constituted as to act upon each other in a logarithmic relation. It is of necessary and universal application wherever mind and body are brought into organic connection. In short, on this view the law is strictly *psycho-physical.* This interpretation has been very generally discredited, principally because it forbids all further research or explanation. Nothing is ultimate which may be explained, and if physical or mental reasons can be given — as the other two theories hold they can — for the disproportion between sensation and stimulus, then the assumption that it is ultimate is gratuitous. Fechner supports his view by two considerations, first, that the physiological theory, as stated below, is inadequate, and second, that the law holds in cases of nervous exhaustion. The latter point is met by the consideration that in cases of extreme exhaustion the entire series of stimuli is intensified by a given amount throughout, and when the exhaustion is not extreme, it corrects itself by the "parallel law" spoken of above.

Again, it is held, especially by Wundt, that the law is strictly *psychological*, that is, that the disproportion between sensation and excitation is due to the perception or discrimination of the sensation. On this theory it is not the real sensation which is experimented upon, but perceived sensation; and in the process of taking the sensation up into our apperceptive life it is modified as to its intensity. For example, the simple fact of attention to a sensation changes its intensity; what effect

might not the act of directing the mind to it as is required in the above experiments, have upon it? In estimating this interpretation, it may be said that it can never be critically established since we have no means of getting at the true worth of sensation except as it is interpreted in our attentive consciousness. By intensity we mean intensity to us, in our intellectual life and to speak of the intensity of sensations *in any relative way*, apart from the apperception and comparison of them, is to be unintelligible. Wundt, however, has an ulterior end in view — the support of his doctrine of apperception — and he himself admits that he would not exclude the physiological interpretation.

The third interpretation, which is probably the true one, makes the disproportion spoken of purely *physiological.* According to the advocates of this theory, the law of cause and effect does hold in this case, as in others, but a part of the internal cause is lost in the transmission by the nerves, so that the true excitation at the brain centre is less than at the peripheral organ, and is in direct proportion to the intensity of the sensation which it causes. Briefly stated, the following facts tend to support this view: 1. the phenomenon of nervous arrest would lead us to expect a diminution of the stimulus between the sense-organ and the brain; 2. nerve action is dissipated in heat; 3. force is lost in the exciting of the internal organ, hence, by analogy, we would expect the same in the stimulation of the centres; 4. the general parallel between electricity and nerve-action would indicate resistance to be overcome in the one case as in the other; 5. on general grounds a loss of force may be expected in an extended or complicated mechanism.

While not expressing a dogmatic opinion, yet a decided preference for the last view seems justified by the facts:

although Wundt has been recently reinforced by reliable results, of which a monograph by Grotenfeldt[1] may be particularly mentioned.

With this hasty and imperfect exposition the recent work, technically known as Psychophysics, may be left. We now turn to the second great class of problems which arise from external experiment, *i. e.*, those which are concerned with the duration of mental states, and whose investigation constitutes Psychometry.

## IV. Psychometry (Mental Chronometry)

It is only within the last thirty years that anything like exact and scientific efforts have been made to measure the time or duration of mental states. The necessity of some such measurement first arose in astronomy where the most exact determinations of transit and other periods had to be made. A source of error was early seen in the fact that time was taken up in the transmission of the excitation of the retina to the brain, and also by the impulse (given to the hand to record the event) in travelling from the brain to the hand. This element of personal equation in astronomical work is elevated to a distinct problem in Psychology and its conditions are extended to include all mental states which have the physical basis necessary to the employment of exact experiment. We therefore have a "science of the duration of mental states."

Before the rise of experiment in this connection, desultory treatment had been given to the comparative rapidity or slowness of our "ideas"; such questions, as to whether all "ideas" were successive or some simultaneous, speculations on the cause of the rapidity of

[1] *Das Webersche Gesetz.*

dreams, etc. But being only general descriptions of fact and depending on individual experience and testimony, such observations were almost useless in general mental theory. With the positive work now done in this field, it is quite astonishing how many side lights are thrown on other questions and to what unexpected uses time determinations may be put.

Proceeding upon the assumption already made and established in Psychophysics, we observe that any period of time which is occupied jointly by a physiological and a mental process, and which may be recorded by physiological movements traced by a time-registering apparatus, will involve as one of its factors the time of the mental process with its brain change. If then we have means of measuring the time taken by the physiological conduction alone, we may by subtraction find the former time. Now these conditions are realized in every instance in which we perform a movement in response or reaction to a stimulation from without. For example, suppose I hear a word and then write it; the sensation of sound is the central link in a chain of nervous processes beginning in the ear and ending in the hand. From the ear the stimulus is transmitted to the brain, and from the brain the command to move is carried to the hand; between these two processes, the third or "central" fact, sensation with brain change, has taken place. Now such a chain of events involving any stimulation and movement, and a conscious event connecting them is called a "simple reaction," and the time that it takes is the "simple reaction time." The determination of this time is the first problem of mental chronometry.

The simple reaction time is determined for any sense with its reaction in movement (for example a sound and

consequent movement of the right hand) by connecting the hand movement with a very delicate clock (chronoscope or chronograph) in such a way that there is an instantaneous stoppage of the clock upon the movement of the hand. This is arranged by directing the person experimented upon to press an electric button when he hears a signal (say a bell stroke). Now let the bell stroke emanate from the clock as it reaches a certain indication upon its dial — and our experiment is ready for trial. The experimenter stands ready to press the button — the bell sounds — he presses — the clock stops. The dial face now indicates the time which elapsed between the actual sound of the bell and the movement of the hand. Now calling the time taken up by the nervous process to the brain *sensory* time (S), the time occupied with the nervous conduction from the brain to the hand *motor* time (M), and the time of the "central" event between them, *perception* time (P), we can express the simple reaction time (R) in this equation:

$$(1) \qquad R = S + P + M,$$

in which S and M are purely physiological.

This determination has been made by a great many observers upon three of the senses, sight, hearing and touch, with remarkable uniformity of result. It varies with different classes of sensations and with individuals from $\frac{1}{8} - \frac{1}{5}$ sec.[1]

Recent experiments of Helmholtz and Dubois-Reymond have determined the velocity of both sensory and motor nerve conduction, so that we may substitute

[1] The writer's average time is $\frac{1}{8} - \frac{1}{7}$ sec., after considerable practice. See, however, the papers on "Reaction Time" below in this work for additional facts and distinctions.

known values for S and M in the formula given above, as follows:

$$S + P + M = .15 \text{ sec. (about).}$$
$$S + M = .06 \text{ sec. (about).}$$
$$P = .09 \text{ sec. (about).}$$

The word "about" indicates variations for the different senses, etc. For all the senses the general law will hold that the purely physiological time (S + M) is less than half of the entire reaction time.

Having the simple reaction experiment arranged, we may vary the conditions in a variety of ways and thus arrive at the most favorable mental attitudes for quick reactions. In the simple experiment, the excitation (sound above) was expected, but the exact moment of its occurrence was not known. If a warning is given to the "subject" by a preliminary signal, the reaction time is shortened. Again, if neither the kind of excitation nor the time of its occurrence is known, the time is greatly increased. From these two variations we gather that the state of the attention has a great influence upon the reaction. As we would expect from our ordinary experience, when the attention is taken unawares a longer time is required to respond actively to external influences.

Another exceedingly important influence is practice. This is due to the artificial conditions of all experiment, and the increased facility we acquire by personal adjustment. We react a thousand times daily under less artificial circumstances, and since the reaction time is diminished by practise, it is probable that our customary, habitual, responses to stimuli of sense are more quickly performed than the most favorable experiments would indicate.

Having now reached what may be called the "mental"

time (P) the question arises: how is this to be divided between the perception or apprehension of the sensation and the volition to respond by movement? Two methods of experiment have been devised for breaking up this period into its elements. The first consists in experimenting on cases of very close physical association — as between hearing and speech, right hand and foot, etc., where the reaction is almost automatic and the will element is practically ruled out. The subject agrees beforehand to repeat any familiar word spoken to him as soon as he hears it. Experiments of this kind led Donders and Jaager to the following principle: the relative times of perception and volition depend upon the degree of physiological association between the receiving and reacting organs; when this association is close the mental time is largely taken up with perception, when loose, it is nearly all occupied with volition.

The other method, that of Wundt and Baxt, consists in repeating the excitation one or more times before the voluntary impulse for the reaction is given. Thus the perception element is repeated and the difference between this time and the simple reaction time is the time due to the additional acts of perception. For example, let two equal and moderate excitations, say bell strokes, follow each other quickly, the reaction being made only after the second; we then have the equation (here p represents the perception of the first stroke, which carried no volition with it):

$$(2) \qquad R' = S + p + P + M.$$

Now, repeating the experiment with only one stroke, we have as before:

$$(1) \quad R = S + P + M.$$

Subtracting (1) from (2), we have:

$$R' - R = p.$$

Here R′ and R are readings from the clock. This gives a numerical determination for p. The volition time will then be P − p.

From this latter experiment a curious result follows if the successive excitations are of very different intensities. If the more intense follows in fact, it is, nevertheless, heard first, and the less intense, really first, follows after; or they may appear to be simultaneous though really successive. This is the case in general whenever the attention is strongly drawn to the second stimulus and follows from the principle already spoken of, that the attention, when concentrated, diminishes the reaction time. This will be the case in general whenever the diminution in the reaction time of the second exceeds the real interval between the two. The same phenomenon is experienced often when one is awakened by a loud noise. He hears the noise after he awakes, though it was the noise that awaked him. It simply means that because of the dormancy or preoccupation of attention in dreamland, the reaction time of the sound is lengthened into his waking consciousness, while the shock to the nervous apparatus was sufficient to rouse him from sleep. This shows also that the order of associated states in memory depends upon the movements of attention in the first experience rather than upon the order of external events. The fact is also important in astronomical observation; a new excitation to the eye, such as the appearance of an expected star on the meridian, is anticipated by the attention and given a reaction earlier than its true position would confirm.

The distinction between perception and reproduction, that is, between the conscious form of a direct intuition and that of a memory picture, is very artificial, inasmuch as reproduced images enter in all our perceptions and influence their time. We have dealt heretofore with simple perception as if this influence did not exist, but a moment's reflection shows that it should be taken into account in all time measurements. In the experiments of which I have spoken, in which attention plays a part, that is, in which the subject knew before he experienced the excitation, its nature and quality, the reaction time was diminished, for the reason that it was possible to call up a memory picture of previous experiences and hold it before the attention, in such a way that the voluntary impulse could be set in play almost immediately upon the discharge of the sensor centres. For example, if the subject expects the stroke of a bell, he recalls the sensation of a previously heard stroke, and the organs are in readiness to respond. So what we have called perception time really results from a diminution due to reproduction. The true time for perception must be obtained by experimenting with excitations entirely unexpected and the differences between the reaction time in this case and that of an expected excitation of the same nature, due to the influence of reproduction simply, is sometimes half the true perception time.

The problem then arises to determine the reproduction or simple association time, that is, the time which elapses between the full perception of a first image and that of a second which the first suggests. To do this we must first determine the time of a complete association reaction, that is, the time which elapses from (say) the hearing of a word, as *storm*, and the utterance of a closely associated word, as *wind*. The association must

be spontaneous with the subject and the original word a monosyllable and very familiar. The uniformity of result is surprising considering the variety and indefiniteness of our customary associations. Our equation is now (A representing the new element due to association):

$$(3) \qquad R' = S + P + A + M.$$

Reacting again for the word alone without the associated image, we have

$$(1) \qquad R = S + P + M.$$

By subtraction, $A = R' - R$, hence value for A.

The average of experiments gives this value about $\frac{3}{4} - \frac{4}{5}$ sec.

These results hold only for close associations established by long habit, especially those dating back to childhood or early life. A third process upon which experiment has been employed is that of discernment, that is, the act of *distinguishing* between given images and indicating the distinction by *choice*. The excitation, say a red light, is agreed upon and is exhibited to the subject indiscriminately with another, say a blue; the subject to react only when he sees the red. In this process, it is seen, two intellectual acts occur; 1. *comparison* of the visible light with the reproduced image in consciousness, 2. a *judgment* as to their identity or non-identity, and these imply 3. the act first of all of simple perception and, 4. last of all the act of volition, as in the preceding cases. Letting 4 represent the whole distinction time, we have:

$$(4) \qquad R' = S + P + D + M.$$

Now reacting simply:

$$(1) \qquad R = S + P + M.$$

By subtraction, $D = R' = R$.

Thus arrived at, the time of distinction is found to be for two indiscriminate stimuli, $\frac{1}{20} - \frac{1}{10}$ sec. I say for two stimuli, for the time is lengthened, as we should expect, when the possible choices are increased. For example, if we use three lights, red, blue and green, the time occupied in a true discrimination is longer, and it increases geometrically. Wundt experimented with the letters of the German alphabet, and others with both English and German printed characters. It is found that it takes about $\frac{1}{2}$ sec., to see and name a single letter, and that it takes longer to distinguish the German characters than the English.

The time of the judgment has also entered into all our measurements heretofore, and it is impossible to isolate judgment as a distinct function for purposes of experiment. As an act in time it can be viewed only in particular cases and under prescribed conditions, and even then the time is to be considered relatively to that of other processes which are necessarily involved.

Trautscholt has studied the time of the "judgment of subordination" from genus to species. A word is spoken and the subject reacts as he conceives a word in logical subordination to the given concept, for example, *animal — dog*. An element of association, which it is impossible to eliminate, also enters largely here. By the same process as before, we find the value of J (judgment) from the equation of the entire reaction, to be about 1 sec.; it is slightly longer than that of the simple association. It varies also with the specific quantity of the logical terms. That is, (a) the time is longest when the subject is abstract and the predicate a more general notion (virtue — honesty); (b) shortest when the subject is concrete and the predicate particular (hound — Bruno).

Besides these and other positive results, additional

important contributions to psychological science have been made. It may be well, in closing, to indicate some of the more general bearings of these time measurements; resting satisfied, however, with their mere statement, since we have no space left for theoretical considerations.

The researches already mentioned have led to the determination of the "span" of consciousness — the sum of possible presentations held together in consciousness at the same time. It has long been a disputed point as to whether presentations are ever simultaneous. It has been shown by Dietze that our sound consciousness can compass from 10 to 12 regular successive excitations by a single effort of the attention. The number of presentations for sight is probably much less — about 5 or 6. The most favorable interval between the sound stimuli is .25 sec. When the number is greater, they are thrown into successive groups of 4, 5, or 6; showing that the limit of a single attentive act has been passed and consciousness then adapts itself by a rapid shifting of its focus.

Again, as is readily seen, this work has tended to the emphasizing and defining of the voluntary side of the mind, as given in acts of the attention. The results here alone more than pay for the entire work the researches involve. That the will is to-day a question of capital importance both in psychology and general philosophy, and that philosophers are hopeful and expectant of results in the theory of our active life as never before under the lead of speculation, is largely due, I think, to the new psychology. Realist and idealist are alike tying their cables to the anchorage of mental "activity;" and when the recent International Congress of Psychologists, in session in Paris, announced, among the topics which needed special and immediate investiga-

tion, the "nature of mental effort," it was only an official expression of what was in the minds of us all. The experimental work described above has cleared up the problem of the attention in many of its conditions: its relation to the time-sense and the origin of the idea of time, its inseparable connection with muscular activity,[1] its bearing upon intensities everywhere in mental experience, its influence in our perception of the external world and of space — indeed one cannot arise from the study of physiological psychology as it now spreads out before us the data of which we have only noted certain divisions, without the overwhelming conviction that it is upon the theory of mental effort in attention, with feelings of resistance, that the general psychology of the future will be erected.[2]

Such experiments also show the relatively reparable character of mental states in their dependence on physiological states, and at the same time the clear necessity of a circumscribing, grouping, and arranging form or scheme. In dealing with what I have called internal psychology as open to experiment, with abnormal and diseased states of mind, this question of unity and form becomes an open one; but from the work now spoken of we have a certain emphasis of the modes of conscious activity.

[1] A recent and important fact lately brought out is, that the reaction time is often shorter if the attention be directed to the reacting sense (hand) rather than to the receiving sense (ear). See subsequent papers in this volume on "Reaction Time."

[2] The prediction has now (1902) been fully realized in the extraordinary development of "motor" theories in connection with many general problems, and in the use made of the active functions in genetic psychology.

## V. The Exhibits in Psychology at Chicago

We are now prepared to consider the exhibits made in the interests of Experimental Psychology at the Columbian Exposition. It is evident that departments in which progress is in the main abstract and immaterial — such as the social, moral, and theoretical sciences — cannot show their work to the eye, and they have heretofore appeared at the world's great expositions only as their results have been embodied in things of practical life, — in education, and in institutions. It is, however, unfortunate that this should be so; for the more ideal and spiritual aspects of a nation's life are just the aspects in which popular instruction is defective, and these are the aspects which should least of all be omitted in a survey of the conditions of present-day civilization. Yet it is so; and it becomes easy to see, therefore, that it is only as psychology has become experimental and so has found it possible to state its problems and results in some degree in forms which allow of diagrammatic and material representation that it is able to "exhibit" itself. What psychology showed, therefore, at the Chicago Exposition was its experimental side.

The exhibits bearing on psychology in its scientific aspects — as apart from the educational aspects, of which I shall speak later on — may be placed in order thus:

(A) A collected exhibit made by the department of Anthropology, of which Professor F. W. Putnam of Harvard University was chief, under the immediate direction of Professor Joseph Jastrow of the University of Wisconsin, consisting of a Psychological Laboratory in operation with all its accessories.

(B) A collection of instruments shown in the German Educational Exhibit under the heading "Psychophysics."

(C) Instruments shown in the general exhibit of the "Deutsche Gesellschaft für Mechanik und Optik."

(D) The private exhibits of particular instrument-makers.

(E) Exhibits made by single universities, — those by the University of Pennsylvania and the University of Illinois.

I may consider these briefly in order.

(A) *The Laboratory for Experimental Psychology, gathered by the Department of Anthropology (Ethnology).* — This laboratory constitutes the first attempt ever made to exhibit at an international fair the state of progress of the world in this branch. When taken in connection with the other laboratories exhibited by this department, *i. e.*, in Anthropology and Neurology, it may be accepted, in its main features, as an adequate historical index of the psychological progress of the nineteenth century. The general features of the working laboratory cannot be better described than in the words of the director, Professor Joseph Jastow.[1]

*The Psychological Laboratory.* — "The object of this laboratory is to illustrate the methods of testing the range, accuracy, and nature of the more elementary mental powers, and to collect material for the further study of the factors that influence the development of these powers, their normal and abnormal distribution, and their correlation with one another. The laboratory is thus designed, not as are those connected with universities, for special research, or for demonstrations and

[1] *Official Catalogue of Exhibits*, Department M, in which full descriptions may be found.

instruction in psychology, but as a laboratory for the collection of tests. As in physical anthropometry the chief proportions of the human body are systematically measured, so in mental anthropometry the fundamental modes of action upon which mental life is conditioned are subjected to a careful examination. In both cases the first object is to ascertain the normal distribution of the quality measured. With this determined, each individual can find his place upon the chart or curve for each form of test and from a series of such comparisons obtain a significant estimate of his proficiencies and deficiencies. It should not be overlooked that mental tests of this kind are burdened with difficulties from which physical measurements are comparatively free. Our mental powers are subject to many variations and fluctuations. The novelty of the test often distracts from the best exercise of the faculty tested, so that a very brief period of practice might produce a more constant and significant result. Fatigue and one's physical condition are also important causes of variation. It is impossible in the environment of the present laboratory to secure the necessary time and facilities for minimizing these objections. They detract more from the value of an individual record than from that of the combined statistical result. So much remains to be done in this line of investigation that at every step interesting problems are left unanswered. But what has been done emphasizes the importance and probable value of further research. The problems to be considered, when once the normal capacity has been ascertained, are such general ones as the growth and development with age of various powers; what types of faculty develop earlier and what later; how far their growth is conditioned upon age and how far upon

education; again, the difference between the sexes at various ages, differences of race, environment, social status, are likewise to be determined. The relation of physical development to mental, the correlation of one form of mental faculty with others, the effect of special training, — these, together with their many practical applications, form the more conspicuous problems to the elucidation of which such tests as are here taken will contribute. In addition to the interest in his or her own record, the individual has thus the satisfaction of contributing to a general statistical result."

(B), (C), (D), (E) *The Exhibits of* (B) *the German Educational Department*, (C) *the "Deutsche Gesellschaft für Mechanik und Optik,"* (D) *Individual Private Instrument-makers and* (E) *Separate Universities.* — The two German agencies mentioned as (B) and (C) send what may be considered as on the whole the best indication — when taken in connection with the special pieces of apparatus sent from German workshops to the collective exhibit of the department of Anthropology — of the application of modern mechanical skill to the construction of instruments of the delicacy required for psychological experiment. These instruments are mainly adaptations of well-known principles, and often of well-known apparatus, used in experimental physiology, physical optics and acoustics, electricity, etc. The instruments shown by the German Mechanical and Optical Society are almost entirely common to psychology and other sciences. The pieces in the German Educational Exhibit are largely the special arrangements found useful in the laboratory at Leipzig, and so show very inadequately the real progress of the science in Germany. Yet they are of some historical interest. The collection is much less complete than that made by

the German instrument-makers in connection with the collective exhibit in the Department of Anthropology. In this connection it should be mentioned that the account given of Experimental Psychology in Germany by Professor Wundt in the official book, "Die Deutschen Universitäten" (ed. by W. Lexis, 1893), is not adequate if considered (and probably the author did not intend it to be so considered) as an exposition of the present condition of this science and the place it occupies in the German universities.

(D) The private exhibits of individual firms should be noted in the attempt to make one's conception of psychological activity complete. French exhibitors did not combine as the Germans did, and so lost both in effect and in local position. Yet much of the finest work is done in Paris, as is witnessed by the cases of surgical, physical, and psychological instruments grouped in the north end of the Anthropology building. An examination of the catalogues of the exhibitors may serve for this class of exhibits, as the united catalogues of the other collections mentioned serve in respect to them. The German makers have done their work more largely in connection with great university laboratories, and so have subserved better the needs of particular students in solving particular problems in physics and psychology: the French, on the other hand, have found the demand more marked from the side of clinical medicine and experimental physiology.

(E) The separate university exhibits of the Universities of Pennsylvania and Illinois were located respectively in the Liberal Arts and the Illinois State Building. The aim of the former was to present a working laboratory restricted to a small number of topics. This original purpose was not subserved through the failure to provide

attendants to collect experimental data; yet the arrangements for experiments in reaction-times and the visual æsthetics of form were instructive to visitors.

## VI. Psychology at the Columbian Exposition[1]

The division of topics in science at Chicago, whereby such subjects as Neurology and Psychology were included under Ethnology, has had in the event considerable justification, in spite of much criticism and some ridicule. For when we look at the way in which Psychology in particular fares, in comparison with its fate at other expositions, the difference is very striking.[2] The principal, as it is also the official exhibit, in the department of Ethnology, is in the gallery at the north end of the Anthropological Building. It was gathered by Professor Joseph Jastrow of the University of Wisconsin, who was appointed assistant to Professor Putnam for this duty; and no praise would be, I think, too high for this really admirable collection of apparatus, charts, etc., illustrating the principal problems and results of the "new psychology." Professor Jastrow's difficulties were great, and it is only fair to say that his success is also great. This main exhibit is displayed in three rooms, viz., a working laboratory, where a series of sense and memory tests are offered to candidates from the visitors in the building; an apparatus-room, which is well filled with instruments topically arranged; and a third room partly devoted to the exhibition of graphic

[1] From the *Nation*, Oct. 26, 1893.

[2] The use of this principle of classification of scientific and other material in large groups, as against its arrangement in scattered exhibits, placed the Chicago Exposition, in my opinion, very far ahead of the late Exposition Universelle (1900) at Paris.

charts, showing some results of modern researches in a form easily taken in by the eye. This last feature is, however, very meagre, owing, I suppose, to the difficulty of getting authors to restate their results in such a form for a special occasion. Another room is given up to an anthropological library of books and journals, only moderately full and representative, and with a rather poor showing for Psychology.

The collection of apparatus is probably the most complete, as a whole, that has ever been made, notwithstanding some obvious deficiencies. For example, instruments for sound and tone-experiments are almost altogether wanting; and if this omission is excusable in the working laboratory, considering the incessant noises made by the busy fair-goers, it is unaccountable in a simple apparatus exhibit, except on the supposition that makers and owners could not be persuaded to contribute. The pieces for sight, muscle-sense, and color-sense are well chosen, and so is the apparatus for demonstrating the laws of reaction-time and other special psychophysical principles. Of course, it is impossible, without becoming too technical, to give a detailed account of these instruments.

In the testing-room, a series of interesting sense and memory tests are given to all comers. The educative value to those taking them, and to the public generally, is probably their greatest value under the circumstances, which are not conducive to scientific accuracy. More may be expected, however, from a series of results obtained from different colleges in this country, where the same tests were given to groups of students by competent instructors before the Fair opened. These results, together with a detailed description of the tests themselves, will, it is hoped, be published by Dr. Jastrow.

The arrangements for administering these tests, I may add, exhibit much ingenuity.[1]

In conclusion, I may be allowed a word of reflection on the present state of experimental psychology so far as it is revealed in these exhibits. Most of the separate instruments are contrivances of particular men for the investigation of particular problems. The science has not yet reached the stage of real demonstration — the stage at which its acknowledged results may be stated under general principles of critical value, whose truth may be shown by a few representative experiments. No doubt we shall, in the future, have more demonstration apparatus of recognized value — apparatus indispensable to teachers in class instruction. But it must be admitted that instruction in this field is now very haphazard, and each teacher is a law unto himself, both as to what he shall teach and as to how he shall teach it.

Another reflection is more encouraging. It arises from the very extraordinary display made by American institutions and professors as compared with those from abroad. And this discrepancy cannot be attributed to lack of interest on the part of the foreign psychologists, for, despite such lack, it is still true that this continent has to-day more chairs for the prosecution of research and teaching than all the world besides, and as many laboratories. The actual results so far attained dispel all fear that the movement is a mistake or a fad; and, with a continuation of the liberal treatment already given to the subject by the universities, great things may be expected in the future.

[1] For detailed accounts of psychological apparatus to date (1901), see Baldwin's *Dict. of Philos. and Psychol.*, I., "Laboratory and Apparatus," and on tests, see *ibid.* II., "Tests" (psychophysical.)

## VII. Educational

The educational aspects of the new work in psychology are of great importance. It is evident that education has two claims to make upon this study; one of these claims the old psychology aimed to meet, the other it was incapable of meeting. The first of these two duties of psychology to education is this: it should take its place as a factor in liberal collegiate culture in both of the functions which a great branch of learning serves in the university curriculum, *i. e.*, undergraduate discipline and instruction, and post-graduate research discipline.

The older psychology, especially in America where it was hampered by the conditions pointed out in an earlier section, did, as I say, aim to instruct undergraduates. But even in this it was a means to another end: it was propædeutic to a philosophy and to a theology, both of which, as far as their demands upon "mental science" were concerned, were dogmatic and illiberal. But the graduate disciplinary function was never served in any sense by the faculty psychology nor by the philosophy founded upon it in America.

The second great educative function of psychology is this: it should mould and inform educational theory by affording a view of mind and body in their united growth and mutual dependence. Education is a process of the development of personality under the best attainable conditions; and psychology is the science which aims to determine the nature of such personality in its varied stages of growth, and the conditions under which its full development may be most healthfully and sturdily nourished. One of the first duties of psychology, therefore, is to criticise systems of education, to point out "the better way" in education everywhere, and to take no

rest until the better way is everywhere adopted. This duty the old psychology did not realize; indeed, by its method and results it was cut off from the realization of it. It shall now be my aim to show briefly how contemporary psychology is addressing herself to all these undertakings.

(a) *Psychology as Research Discipline.* — I begin with this point because it is the most striking fact about the present state of psychology in all countries where the experimental idea has been given entertainment. Probably students and general readers hear more about "research" in connection with psychology than with any other branch. And it is odd — indeed to workers in other departments amusing — that all this claim to research ability, and talk about "original contributions to knowledge," is by professors who are yet smooth-faced and generally quite inexperienced in university affairs. A physicist who makes many contributions to knowledge is rare, but the "new psychology" has two men of research to every competent college instructor in its ranks.

This, I take it, is a hopeful and encouraging state of things, and has its origin in two influences: first, the new impulse has come from Germany, where the university function corresponds very nearly to the graduate-discipline function in the few American institutions where graduate work is encouraged; and second, because the actual state of the subject is such that research is a matter of comparatively less difficulty than in the older scientific branches. Yet the actual value of this condition of things in the permanent development of the subject must be held to be disciplinary and educational; for the more serious and philosophical of the psychologists do not expect these first results of the new methods to

be revolutionary in their value, nor have the researches so far published been much more than suggestions of what may be done when the method is held under better control and those who apply it have had adequate discipline and training in its use.

Accordingly, in my view, the very marked tendency to "research" evident in the management of the new laboratory foundations of the colleges in this country is of main value as offering training to the future instructors in psychology throughout the land, rather than as offering contributions to knowledge. The students in these laboratories come largely from colleges where experimental psychology is unprovided for or held up for criticism by professors of philosophy. The utilization of their results is, in most cases, manifestly impossible.

The research discipline offered by graduate work is indispensable, however, as discipline, since it is at present the only substitute for undergraduate discipline. This, indeed, is the function of graduate work in the other departments of science in the universities. It is emphasized, however, in psychology since, as I shall show below, undergraduate instruction in experimental psychology is still in an inchoate condition even in the few larger institutions in which it has been added to the undergraduate course of study. Chairs in experimental psychology occupied by men whose principal function is graduate discipline — although in some institutions the undergraduate function is being recognized — are now no longer novelties. In the United States the extension of this method of treatment has been rapid, and the establishment of chairs and of laboratories extraordinary. The first laboratory, since closed, was established in 1883 at Johns Hopkins University.

The treatment of general psychology, also, is adequate as never before in the graduate instruction of the country. The courses of lectures and the instruction by the Seminar method gather large numbers of students who have already graduated in less pretentious colleges. The publication in recent years of so many systematic treatises, especially in America, has contributed to this; a dominating influence in this matter being a work which has proved to be a *vade mecum* to psychological inquirers — the "Principles of Psychology" of Professor William James.

*B. Psychology as Undergraduate Discipline.* — The position of psychology in the undergraduate curricula of the leading institutions also invites remark. Two important changes may be discerned in recent years, both indicating the permanent breaking away of this discipline from its earlier hampering connections: first, the recognition of the aim of the science as self-knowledge and self-control; and second, the introduction of the experimental method of instruction.

The first of these tendencies is shown in the remarkable change worked (and still working) in the qualifications and training of the occupants of chairs in philosophy and psychology. Even the smaller denominational institutions are following the lead of the great eastern foundations, and of the progressive state universities, in seeking men who are trained to the same rigorous interpretation of fact and search for it that are the first requisites of the genuine *Naturforscher* in other branches of science. The guardianship of this important realm, the mind, from outside, in the supposed but mistaken interests of religious and ethical truth, has had its day in many institutions — at least in any sense that denies to the investigator and teacher

the full liberty of disputing hypotheses which facts do not support, and of stating those, however novel, which well-observed facts do support. Consequently philosophy and psychology are now self-controlling departments in the colleges; and so the courses of psychology are arranged with view both to the adequate instruction of the student in its history and results, and with view to that high discipline which the pursuit of the "moral" — as opposed to "physical" and "natural" — sciences undoubtedly gives.

Second, the introduction of the experimental method of instruction has had its beginning. It consists in the actual demonstration of the leading facts of experimental and physiological psychology in the class-room with added opportunities for students to perform them upon one another, and, under certain topics, upon the dissected nervous systems of animals. One of the results is the greater concreteness and interest given to the subject for younger students and the correspondingly increased election of all the branches of the tree of philosophy in the later years. The union of the two functions of introspection and experimental observation thus secured renders this branch, in my opinion, of unique and as yet undeveloped value in the total discipline of college life.

It is evident that this undergraduate service cannot be adequately realized until the science which aims to render it is itself well developed and sufficiently categorized. The actual condition of things suggests encouragement, therefore, but not enthusiasm. It is evident that such a method of instruction is at present impossible to any but the original workers in this field, and they indeed are each a law unto himself. There are very few experiments of a psycho-physical or psy-

chological kind which are of such evident importance and value as to be recognized by all as available for class demonstration. And a more radical defect is that there are very few principles as yet formulated which can be adequately demonstrated by single or grouped experiments. The whole exhibit of apparatus at Chicago contained very few things which are suitable and convenient for untrained use or illustration; this is an indication of the difficulties still in our way. It is a duty which experimental psychology owes to education to meet this need by bringing her results into line with the more elementary principles of general psychology, of providing simple apparatus which can be used by less expert instructors, and of preparing text-books for junior classes. While no text-book to-day exists for this purpose, it is yet gratifying that two such "Courses in Experimental Psychology" [1] have already been announced by competent writers, both American (Professor Sanford of Clark University and Professor Titchener of Cornell University).

Reference to the latest catalogues of Brown, Wisconsin, and Michigan Universities (not to mention many others) may serve to show the nature of the courses offered in institutions where the work is as yet mainly undergraduate.

*C. Psychology in its Bearings on Pedagogy.* — Finally, the relation of psychology to the science of education may be given a word after the discussion of its place in practical education. Pedagogy as a science treats of the application of psychological principles to the development of normal and cultured personality. The ground-work of such a science must be afforded therefore by psychology; and inasmuch as the teacher has

[1] Both have now appeared (1902).

to do with body as well as mind and with mind principally through the body, it is experimental or psychophysical psychology to which this duty to theoretical education mainly comes home. It is needless to say that there is no such science of pedagogy in existence. Most of the books which have heretofore appeared in America on this topic — and their name is legion — are unworthy of serious attention. Further, the importation of the German *a priori* "Systems of Pedagogics" finds its main service in keeping awake the expectation and the *amour penser* of teachers: not in affording them much empirical assistance in their task. Yet it is encouraging that the phrases "child-study," "self-activity," "apperception," "scientific methodology," etc., are in the air, and every teachers' convention listens to reams of paper on such topics.

Contemporary psychology is becoming aware of this duty also, however far she may yet be from performing it. Children are being studied with some soberness and exactness of method. Statistical investigations of the growth of school-children, of the causes and remedies of fatigue in school periods, of the natural methods of writing, reading, and memorizing, are being carried out. The results of several such inquiries were plotted for exhibit in the department of Anthropology at Chicago. Questions of school hygiene are now for the first time intelligently discussed. The relative values of different study-disciplines are being weighed in view of the needs of pupils of varying temperaments and preferences. And it only remains for the psychologists — themselves teachers — to set the problems and establish the methods, and all the enthusiasm that is now undirected or misdirected will be turned to helpful account. Among those who have addressed themselves to this task in

this country with information and influence one name may be mentioned without invidious comparison, that of W. T. Harris, U. S. Commissioner of Education, Editor of the "International Education Series."[1]

## VIII. Psychology and Other Disciplines

It is necessary, in conclusion, in order that this report may adequately present the conditions under which psychology exhibits herself and her historical progress, to speak briefly of the relations which this topic sustains to the other "moral" forces which make up largely the culture element in our present-day social environment. The traditional connection with philosophy is not severed by the new directions of our effort, but on the contrary they are made more close and reasonable. The change in psychological method was due in part, as I have said above, to changes in philosophical conception; and it is only part of the same fact that scientific psychology is reacting upon philosophy in the way of healthful stimulus. Both the critical idealistic and the critical realistic methods of philosophy are richer and more profound by reason of the lessons of the new psychology. It was only just that the science which owed one of its earliest impulses in this country to a book from an advanced thinker of the former school, the "Psychology" of Professor John Dewey of the University of Michigan, should repay the debt by its reconstruction of the Kantian doctrine of apperception in terms acceptable to the later thinkers of that school. And it is no small gain to both schools that their issue should be joined, as it is to-day, on ground which stretches beyond their old battle-fields

[1] Series of pedagogical monographs based on Experimental Psychology are now being edited by Ziehen (German) and Binet (French).

by all the reach of territory covered by the modern doctrines of Naturalistic Evolution and the Association Psychology. Philosophy escapes the charge of Lewes that her discussions are logomachy, when the disputants on both sides are able to look back upon those even of the late period of Lewes and admit the essential truth of both of their hotly-contested formulas. So far as this is the case, I venture to say that it is due to the progress of psychology in giving content to the terms of the logomachy and in enabling the best thinkers to reach more intuitions at once synthetic and more profound.

The relation of psychology to theology is also now as close as ever, and must remain so. And the obligation must become one of greater mutual advantage as psychology grows to adult stature and attains her social self-consciousness in the organization of knowledge. The benefits which theology might have gained from psychology have been denied in great measure through the unfortunate attempt to impose the theological method upon the treatment of the whole range of mental fact. The treatment of "Anthropology" included in the text-books of systematic theology bears about the same relation to that of current Psychologies like Höffding's and James' as the physiology of the philosophers not long since bore to the work of the neurologists and morphologists. It is evident, however, that this condition of things is now happily mending; and it is to the credit of James McCosh, lately President of Princeton College, that he first, of the theologians who were teaching philosophy in this country, welcomed and advocated the two new influences which I have taken occasion above to signalize as the causes of the better state of things: the influence of the German work in psychology (see Preface to Ribot's *German Psychology of To-day*,

1886) and that of the evolution theory in biology (see *Religious Aspect of Evolution*, 1888).

Finally, I may note the growth of a new department of psychological study which aims to investigate the mental and moral life of man in its social and collective conditions. The evident need in such subjects as Sociology and Criminology is the knowledge of the laws of human feeling and action when man is found in crowds, orderly or disorderly, and in organizations, legitimate or criminal. This need is now beginning to be felt both by sociologists and by psychologists, and we may hope that the questions already started in Italy by Ferri, Sighele (*La foule criminelle*, 1893), in France by Tarde (*Les Lois de l'Imitation*) and Guyau (*Education and Heredity*, Eng. trans. 1892), and in England by Spencer, may receive fruitful development in this country. It is an interesting sign of the times in education that the theological schools are beginning to realize the need of such knowledge of collective man, as part of the training of the ministry. Instruction in social questions is made a separate department in the Yale Divinity School and in the Chicago Theological Seminary, as well as in other such institutions.

*En résumé*, I have only to add that psychology is now the branch of knowledge which is developing in most varied and legitimate ways; and that the exhibition made at the Columbian Exposition, while not adequate in many respects, yet served, to those who studied it intelligently, to indicate the present gains and the future prospects of the science.

# VII

## THE POSTULATES OF PHYSIOLOGICAL PSYCHOLOGY[1]

THE last thirty years have been rich in new things. We hear the claims of a new theology, a new literature, a new education. And if these departures were new as the styles are new, and exhibited the changing phases of intellectual taste alone, we might judge them ephemeral, and let them die. But when we remember that intellectual history is dynamic, that thought is the true reality, and a movement in thought an irrevocable step of progress or retrogression — that a new means an old and that age is decay, we feel the importance of radical changes in any of these departments, and wish to be well convinced before we endorse them.

The present encouraging state of psychological science and its hopeful outlook into the future are due, no doubt, in large measure, to the clearer enunciation of the principles of the so-called "new psychology" and the wider range which contemporary science affords for their consistent application. The question was asked, indeed, long ago, "Can psychology be made a natural science?" — and when the most acute thinker of modern times, from his seclusion at Königsberg, confirmed as an oracle the negative of his predecessors, the impulse toward an empirical treatment of mind was again restrained for a century; and necessarily restrained, since French empiri-

[1] From *The Presbyterian Review*, July, 1887.

cism was sentimental rather than theoretical, and English empiricism was agnostic rather than constructive. But the change is now making, and it seems to be the necessary outgrowth of sweeping tendencies of the times. M. Paul Janet describes the movement, whose product is a world-wide realism in general thought, as the reconciliation of science and philosophy, while yet he holds to the essential separateness of the two intellectual spheres; but the change for psychology means more than this.

Either philosophy is too general to mean anything, or it means the rationalizing of science; in either case, we are told, psychology may dispense with philosophy as the other sciences dispense with it, except as their declared results form the *ensemble* of knowledge which, in its ultimate concatenation and adjustment, exhibits the work of a true philosophy. Physiological psychology has no quarrel with general philosophy as such nor with a metaphysic which is sufficiently modest; it only asserts its right and its ability to deal with its own content after its own fashion, promising when it shall have attained full scientific self-consciousness to hand in its reports to the tribunal of higher and more general thought for a place in a developed world-theory.

To say that the soul is natural is not to say that it is mechanical, nor is it to say that there is continuity of law in the natural and spiritual worlds; on the contrary, it is to say that nature is intelligent and that the laws of thought are the laws of things. We know nature as we think it. Nature apart from thought would not be the nature that we know, since nature can be thought. Absolute being is impossible as long as being is a notion. A thing is an object, and a thing which is not thought is, as Zeller well remarks, a thing with nothing objective

about it — that is, no thing. And this is necessarily so from the nature of the perceptive process. Perception has both its objective and its subjective side; that is, perception without an object cannot be perception, just as the object without perception cannot be an object, and the recognition of this duality is the fundamental idea of the new psychology. For twenty centuries men have been reasoning from the ego side of the equation of perception to the non-ego side, and the rich fruits of natural science are the consequence, while they have seldom thought to reason from the non-ego to the ego side, a process whose legitimacy stands or falls with its reverse. If you say I cannot reason from nature to mind, I reply that you cannot reason from mind to nature, since both rest upon the same perception. Why do I believe in external causation? Because I have a causal judgment, and perceive that it works in nature. So to the extent of causation I conclude that nature can be read by thought. If there be subjective causation, nature could not have been constructed without objective causation, and if there be objective causation, the mind could not have been constructed without subjective causation; for the contrary in either case would invalidate perception. We must assume the validity of perception for all science.

This being so, we rationalize nature, and afford, as we have already said, ground for a philosophy of things, but not until we have attained science, and not by a deductive method. The idealist is right in emphasizing consciousness, but wrong in refusing to see that consciousness is bipedal. M. Ravaisson is right in saying that "the true substance of things is the unity of thought," provided we say also that the true substance of thought is the unity of things. We may obtain

psychic data from without as well as from within, for the without is as necessary to the within as the within is to the without.

Far from undermining the standpoint of the old psychology — that is, the inductive science of Aristotle and the British School, this position tends to confirm it; for consciousness can never be escaped, and a groundwork of ascertained knowledge is necessary for scientific construction. The experimenter on association must know that there are ideas and that they are associated, and only a descriptive, that is, a subjective psychology can give these facts. This is admitted by the leaders of the new school, as Wundt,[1] Bain, Ribot, however much in their metaphysic or in the absence of metaphysic some of them may tend to positivism and however much they may exaggerate the relative importance of the objective method.

As to the legitimacy, moreover, of such an expansion of psychology a test is ready at hand. Do psychic phenomena present the conditions necessary to the employment of objective and naturalistic methods? Can the mind be subjected to experiment in analysis, synthesis, and measure? Has the mind magnitudes, first, in duration or time, second, in quantity or mass? The first of these inquiries suggests the function of mathematics, the second the function of general dynamics, and together they constitute the question of method so fiercely discussed in Germany during the last thirty years. It may be stated in classical language thus:

[1] "With the same right with which the physicist conducts his investigations of the phenomena of nature, without reference to the subjective meaning of sensation and perception, with the same right can the psychologist investigate the course of men's experience, inasmuch as he may regard the external world as presentation merely, the product of psychological processes and laws" (*Phys. Psych.* II., 454).

(*a*) How is mathematical psychology possible? (*b*) How is experimental psychology possible?

I have thrown these points of inquiry into the Kantian form because it is Kant who replies to them, with his usual conciseness and authority. He says in effect:[1] "Psychology can never be raised to the rank of an exact natural science," because (*a*) mathematics is not applicable to internal phenomena, "for the internal intuition in which these phenomena must be construed has only one dimension, time," and (*b*) experiment has no range in internal phenomena, for the varied phases of inner observation cannot be changed at will by ourselves or others, and moreover the very fact of observation alters the condition of the subject observed. These two objections hit precisely upon the points upon which a natural psychology as such must rest, and so long as they remained unanswered such a science was made impossible. Two recent psychologists, Herbart and Wundt, have taken issue respectively here and there; we shall briefly interpret the answers they have given.

Herbart is essentially a metaphysician. He postulates ontology and subsumes psychology as a department of the real. Like German thinkers generally, before the rise of the materialistic and positivist movements he "began up," to use Fechner's expressive figure, and "came down," instead of beginning down and going up. He knew the ego immediately, and from this knowledge postulated the universal category of the real, then by a direct circle, to escape the meshes of Fichteanism, as he himself says,[2] subsumed the ego as a species of the genus into which it had been expanded. If the ego be my first knowledge of the real, why may it not be the

[1] *Metaph. Anfangsgründe d. Naturwissenschaft* (Rosenkranz, 5, 310).

[2] Tractate, *Ueber die Subsumption d. Psychologie*, etc., Göttingen, 1835.

sum of the real? If the ego be consistently subsumed from the first, whence comes my knowledge of the real? This is the circle of the realist and the justification of the subjective idealist, and Herbart learned from Hegel to side with the former. But if he was thus saved from the meshes of Fichte, his original conception of the problem of general philosophy and its method saved him, on the other hand, from the fruitless dialectical development of the Hegelians. Philosophy, says he, is the elaboration of conceptions, the completion of internal facts. Matter, a simple thing, a logical subject, is to the senses no longer simple, but a sum of qualities or attributes, each of which is a real. Here is a contradiction. How can the presentation be elaborated and the logical opposition eliminated? Such contradictions meet us on all hands, in our notions of motion, causation, the ego — "how can the subjective be immediately the same as the objective I?" The reconciliation of logical opposites and the consequent rectification of the notion is the task of philosophy.

This is readily recognized as the old problem of Hegel, and the antinomy is formally the same: $a = non\ a$. Hegel admits the validity of both members of the equation and the reality of the contradiction, and aims to make the valid thinkable. Herbart denies the validity of the first member of the equation, makes a substitute for it, and aims to make the thinkable valid. Here is again, in Herbart, the standpoint of the new psychology — external validity.

Suppose we represent an object by A, its notion by M, and its phenomenal manifestation by N; then in the interpretation of A, we have the equation M = N. But we find that this is not true. M in thought is a unit, a simple; N in experience is an aggregate, a complex. As

valid, M must be one with N; as thinkable, M must not be one with N. Assert the contradiction and deny the oneness — you have a thinkable M (claiming with Herbart the ultimate basis of philosophy to be experience, hence the validity of N), but not a valid — and Herbart looks toward Comte; deny the contradiction and assert the oneness, and you have a valid M, but not a thinkable — and Hegel looks toward Fichte. But if we have knowledge by the notion at all, M must be both valid and thinkable. So the notion must be elaborated, changed into conformity to the reality, from a simple to a complex.

To illustrate this and at the same time contract our thought to an application that is psychological, let us look for a moment at the solution of the contradictions in the ego.

As metaphysics is the science of the thinkableness of experience in general, so psychology is the science of the thinkableness of inner experience — how is a natural science of psychology possible? We have seen how Kant answered this question, and are now in a position to interpret the answer of Herbart, for the development of the preceding paragraph is true in terms of self. Let A be the ego as it is, M the ego of self-consciousness (subject), and N the ego of which M is conscious (object). Now, to make M equal to N, the presenting must be the same as the presented I — the subject identical with the object. But, says Herbart, the same entity cannot be in both members of a relation, "the subjective cannot be immediately the same as the objective I." Here is a contradiction. Philosophy must perform its function. The conception must be completed. Instead of a simple M must be a complex; wherein does the complexity reside? To answer this question, we must inquire

into the nature of the real I, and in this answer we shall discover Herbart's true contribution to the new psychology.

The soul is a "real" in a definite and technical sense. "Reals" are the simple, penetrable, innumerable, differentiated, spherical, ultimate postulates of existence. They are "pure position," and by reason of their penetrableness can be conceived as overlapping or interpenetrating each other; this gives rise to material bodies or matter. "The grouping of the monads according to experience is called by us a thing." Thus the noumenon becomes phenomenon. Conceive the reals projected from the space of intellect into the space of sense,[1] and give to them motion in right lines, with all conceivable degrees of velocity. Each real becomes a centre of contending forces, and the resultant varies with the quality of the opposing reals. If reals of opposite quality come into opposition, a condition of permanent strife is induced in consequence of the continued action of unneutralized contraries. The tendency to maintain itself thus found in all things in their last analysis is called *self-persistence*.

The ego, then, as simple being located at a point, strives to maintain itself against the action of vibrating cerebral elements. This opposition gives ideas, which, when viewed as inherent objects of the soul's self-consciousness, are efforts at psychic self-persistence and, considered in their independent relation, objects of internal cognition. "The presentation of these objects," says Herbart, "may be a series of acts of self-persistence against interference from other essences." Now, the sum of these acts of self-persistence of our ideas or mental states must be identical with the subject itself,

[1] For the doctrine of "intelligible space," see *Metaphysik*, § 7.

since the ego sees itself, substituting for the manifoldness of its manifesting states the unity of the manifested I. So this substitution may be reversed. The true multiplicity of consciousness must take the place of a mistaken unity, and the conception of the ego is emended. M is no longer a simple but a complex. $M = N$ is now both a valid and a thinkable equation, and the process of self-consciousness is vindicated.

Whatever we may think of this metaphysic, we see in Herbart's idea of the interaction of representations or images, considered as forces, a new conception of internal facts. If psychic states tend to any degree to influence one another, if one dominates and others grow subordinate, this is sufficient confirmation, in so far, of the new conception, and makes possible a dynamic of mind. For such a science it is not necessary that mental states be forces *per se* in any occult or metaphysical sense nor still less in any materialistic sense, and Herbart distinctly discountenanced any such construction. It is only necessary that they be potent in reference to one another. The advent of a new presentation in the field of consciousness detracts from the intensity of former images, a loud sound drowns a feeble sound, the sun blots out the moon. Force, then, intensity, *mass*, is the second dimension of mind, as *time* is the first, and Kant's objection to the employment of the methods of mass determination, drawn from natural science, is overthrown.

While we owe to Herbart the first step toward an experimental psychology, he himself was false to his conception. He built up a mathematical science as rigid as Euclid and as fallacious as Spinoza. Admitting the application of mathematics to psychic states, why may we not assume psychic axioms and construct a

deductive science? You may, replies the experimental psychologist, provided you show us first the psychic axioms. Spinoza was at perfect liberty to use the mathematical method, provided he were willing to rear his temple on an axiomatic quicksand. Mill's doctrine of Euclid would probably be correct if his doctrine of Euclid's axioms were correct.

This is the difficulty, and it is as old as Kant's second objection to a natural psychology. If a purely mathematical science fail, we must resort to an inductive science — that is, an experimental, either internal or external, or both. Kant objects in general terms: experiment has no application to internal phenomena, for the varied phases of inner observation cannot be changed at will by ourselves or others, and, moreover, the very fact of observation alters the conditions of the subject observed. How have these positions been met?

It would not do to say that recent work has first answered these objections, for the Scottish psychologists replied to them long ago by the employment of internal experiment.

If a science of mind be possible at all, there must be laws of mind. What is the nature of these laws? It does no good to attempt to define mind, as it does no good in the construction of physics to attempt to define matter. Whatever the ultimate constitution of matter be, physics deals with matter as we know it, and whatever the ultimate constitution of mind be, psychology deals with mind as we know it. The nature of the soul, then, is not a question for psychology, but for ontology, or logic in its broad critical sense, and is at once relegated to general metaphysics. If the metaphysician decide that the soul is a substance, psychic phenomena remain the same; and if he decide that the

soul is a function of the body, psychic phenomena are not changed by his decision; so, evidently, the most sensible, as certainly the most logical, method of procedure is to define psychology as the science of psychic phenomena, of all sorts whatever, and to consider the area of its domain the conscious wherever we find it. The psychologist is no longer a speculator, but a seeker after facts.

Pursuing our development, the question at once arises, What are psychic phenomena? How do we know mind? According as we answer this inquiry we take part with one or the other of two opposing parties within the school. We know mind only in its connection with matter, say English empiricists, consequently psychology as science is dependent upon physiology.

It is necessary, therefore, to distinguish carefully the conservatives from the extreme left in the new school. The former comprise the German physiological psychologists, as Fechner, Lotze, Wundt; the latter, the positivist thinkers of England and France, Bain, Lewes, Ribot. The latter are as untrue to the new standpoint as were the old metaphysicians whom they criticise, inasmuch as they take as definite an attitude toward the question of the substance of the soul.

What, then, shall we say as to psychic laws? If there be phenomena purely psychic, there must be laws purely psychic, and if there be phenomena psycho-physical, there must be laws psycho-physical. But it must be remembered that purely psychic phenomena are such only in consciousness, and not in fact, and by a necessary consequence the psychic laws of such phenomena are quite subjective, and can in no way supersede or contradict the psycho-physical laws, which control all psychic phenomena in fact. Psycho-physi-

cal laws cannot be confined to phenomena which are consciously psycho-physical, but must be recognized as in actual operation, even in the highest and most ideal processes of mind. This is only to say that there is a uniform connection between mind and body. If we admit this position we have a duality in the mental life, it is true, but a duality in operation merely, the real duality being that of the conscious and unconscious; while if with Wundt we maintain the independence of laws purely psychic, we violate with him the uniformity of the psycho-physical connection and postulate a real duality of mental functions — the purely psychic and the psycho-physical. Wundt forfeits unity in the account of mind, and finds three problems on his hands instead of one: first, to account for the purely psychic; second, to account for the psycho-physical; and third, to account for the duality.

The position that the whole mental life is consciously or unconsciously psycho-physical may seem at first sight to be a concession to the extreme left, but in reality it is not so. Even if the question as to the nature of the psycho-physical were decided — which is an unwarranted assumption — on the side of the positivist, there still remains the fact that perception is a subjective process, that matter is matter only as it is known, and that the laws of thought are laws of things. As long as the materialist continues to think, so long is he a spiritualist, and so soon as he denies the reality of thought, he denies the existence of all objects.

But setting aside the question of spiritualism as a problem of metaphysics, and gathering up the advance we have already made, the crucial question now confronts us — What is the nature of psycho-physical laws?

It must be remembered at the outset that no answer to this question, which rests upon a preconceived hypothesis as to the nature of the soul, will be received by the new psychology. As an experimental science, it demands that the processes of induction be rigidly enforced, and the nature of the laws be decided by scientific interpretation from the nature of the phenomena upon which they rest. There are, then, three distinct steps, each involving long and detailed research in the various subordinate departments of physiological psychology: first, the observation of psycho-physical facts in all their range with the aid of experiment and reliable testimony; second, the grouping of these facts under their various heads and the generalization of their common qualities; third, the formulation of laws which shall be applicable to the whole or to distinct and necessary subdivisions of the psychological area. Then we shall be able, by a consensus of established relations, to make interpretations bearing upon mind and body and the nature of either. In short, we must do here what is done in every empirical science — at any rate, as much as we can.

Physiological psychology is in the first of these stages, and it is useless as yet to expect, and profitless to attempt, more than minor generalizations. But astonishing activity of research and proportionate fruitfulness of result are preparing the way, we believe, for greater discoveries. The approximate formulation of the laws of cerebral localization, the bearing of nervous inhibition and arrest upon psychic functions, the discovery of trains of cerebral associations, the genetic derivation of the notion of space, the differentiation of nerve courses in the higher centres, the measurement of durations, mainly psychic, together with Fechner's law of the ratio of the growth of sensation and excitation — all afford data, in so far,

for a more sweeping and general hypothesis as to the nature of the psycho-physical connection. For example, the establishment of trains of cellular association goes far toward accounting for reflex activity, toward breaking down the barriers to a comparative psychology, toward establishing a psycho-physical basis for the mental higher processes, and toward affording ground for some such hypothesis as Beaunis' as to the serial and functional interaction of the automatic and the voluntary. But it is only as experimental data become more extended and complete that their interpretation can be made more secure and the subterranean passages, so to speak, can be opened up toward the citadel of the self.

As illustrating this position, the process by which the celebrated logarithmic law of Fechner was arrived at is, perhaps, the best case in point.[1] The problem presented to Fechner was in brief this: given a series of sense excitations — say of sight — increasing in intensity by a constant multiple, to derive the law, if there be one, of increase in intensity of the corresponding series of sensations. First of all, as is a necessary preliminary in the comparison of all commensurate intensities, there must be a term of constant value in each series, sustaining a necessary relation to the same in the other. We conceive the idea that the smallest perceptible sensation may be constant and that the excitation which produces it may be constant also, and after exhaustive experiment upon all the senses, find that this hypothesis is true. Let us then call the smallest perceptible sensation the threshold or zero value in the series of sensations and the corresponding excitation unity in its series, and we

[1] A more detailed exposition of this topic is given in an earlier place (pp. 95 ff.).

have fulfilled the first condition of comparative measurement. We have a fixed point in each scale and the relation between them.

We next ask in what way our sensation scale is to be graduated, but before this can be answered another detailed and delicate piece of research upon the sense organs must be instituted — namely, to determine whether the smallest perceptible *differences* of sensation have a constant value, and if so, what this value is for each of the senses. Again our hypothesis is experimentally verified, and we have added to our data a second generalization, the value of the excitation which produces the smallest perceptible difference in sensation. At this stage we assume the mathematical principle that differentials are equal and consider the smallest perceptible differences as mathematical differentials, and by a summing up of all our knowledge, write the equation:

$$ds = k \frac{de}{e},$$

in which $ds$ is the differential of sensation, $\frac{de}{e}$ the differential ratio of excitation, and $k$ the proportional constant.

Whence by integration:

$$s = k \log. e;$$

that is, *the sensation varies directly as the logarithm of the excitation.* By this law the sensations in an ascending series are directly calculated from the corresponding excitations, and our sensation scale is graduated.

It is seen at once that the essential feature of this operation is its experimental quality. No less than three times we returned to direct experiment upon the

sense organs, and from the facts thus learned drew general truths, to serve in turn as premises for a wider inference. This affords a groundwork of observed fact to the final result, which, in so far as the experiments are reliable and the sources of error known, is not to be damaged by a hundred objections such as the *a priori* impossibility of the measurement of psychic magnitudes or the error of the assumption of a uniform psycho-physical connection.

In this law the first and second stages in the true development of an inductive science are exemplified, and the third, that of interpretation, or, as Mill says, of deduction, is yet to be attained. Considered alone, it is capable of several interpretations, and actually has sustained three, the physiological, the psycho-physical (Fechner), and the psychological (Wundt), and it is only as physiological psychology in its other paths of inquiry is adding to its laws that the first of these is being established.[1] Each of the considerations upon which the interpretation rests is a scientific generalization, and all but one are drawn from direct observation of the nervous system. In sharp contrast with this is the interpretation originally given by Fechner to the same law, viz., it is an ultimate and universal postulate of all interaction between mind and body. Mind and body, said he, are so constituted as to affect each other in a logarithmic relation, and this relation is the "how" of a pre-established harmony. This is to introduce a new metaphysical principle which forbids all further research, and the new psychology will have none of it.

This single law, whatever we may say as to its scientific validity, suffices to illustrate the true method of

[1] See the further statement of these interpretations in the earlier place.

inductive generalization, whether it be from an internal or from an external standpoint.

The question as to the nature of psycho-physical laws is then to be left till the science is more mature. It has been so elsewhere. Kepler's discovery of the elliptical motion of the planets rested upon accumulated observations of the actual positions of the heavenly bodies during centuries; it would have been impossible without them. The laws of chemical synthesis rest upon observed facts of invariable combination, and we would consider the man a lunatic who attempted, for reasons of convenience or prejudice, to convince himself or others that the elements should combine otherwise. So when the psychologist asks that our judgment be suspended in this case in the interest of unprejudiced research, his position is only that of the physicist who will not assert categorically that all the physical forces are one, or that of the geographer who will not declare that all earthquakes are due to the cooling of the globe.

Summing up the results of the foregoing discussion, we may enumerate teaching certain postulates of the science:

1. The naturalness of the psychic; psychology is a natural science.

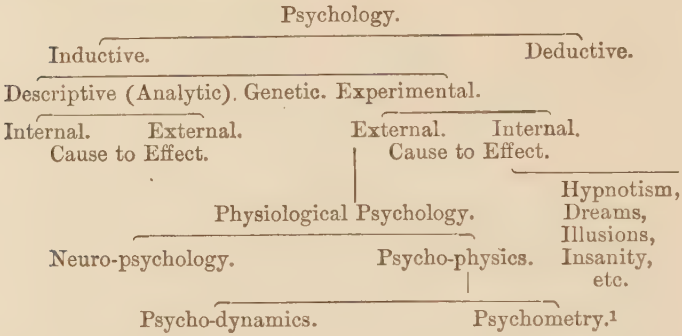
2. The validity of the knowing process and the consequent reality of things; the function of experiment.

3. Uniformity of natural law in the domain of the psycho-physical; the major premise and justification of induction.

4. Unity in the mental life; approach to the higher processes.

We now find it easy to exhibit to the eye the position

of physiological psychology in reference to the general science:




And in accordance with our postulates we may define the science and its subdivisions as follows:

Physiological psychology is the science of conscious phenomena accompanied by nervous change.

Neuro-psychology is that branch of physiological psychology which deals with intra-organic phenomena and their interpretation.

Psycho-physics deals with extra-organic phenomena and their interpretation.

Psycho-dynamics is that branch of psycho-physics which deals with the interpretation of intra-organic phenomena in terms of psychic intensity or mass.

Psychometry [1] deals with the interpretation of intra-organic phenomena in terms of psychic duration or time.

It is not our object to enumerate results in any of these subdivisions of physiological psychology, nor to justify them as legitimate fields of inquiry; but simply to indicate the common ground on which they rest. That they are well established and permanently so,

[1] Mental Chronometry (see p. 110 above).

no one who is abreast of current thought can doubt. The questions of neuro-psychology are perhaps receiving more attention than those of any other department, either of physiology or mental science. Professors in psychology must now be men of scientific training and spirit. Psycho-physical laboratories are growing in importance, and special organs are being devoted to the publication of their results. Recent text-books on psychology vie with one another in incorporating the fruits of experimental research. No university course in mental science is now complete which does not present at least the methods and main results of scientific psychology, even though it be only to attempt their refutation, and our collegiate institutions are seeking men of proper training for exact and original work. This certainly indicates progress. If the additions that are making are additions of fact outside the domain of mind, their discovery aids some other science; but if they belong to the psychic or bear in any way, however remotely, upon it, the old psychology erred in defect, and should be free to enlarge its view.

This is all that is demanded by conservative thinkers, and it is only as a department of the general philosophy of mind that they admit it to be a "new psychology" at all. Nature can be interpreted only as it is known, and knowledge of nature can be attained only through the canons of exact research; consequently spiritualists will be the first to reap advantage from any new light thrown upon the correlations of mind and body. As long as consciousness is immediate and matter is mediate there can be no question as to the ultimate adjustment of their claims, and there should be no hesitation in widening the borders of the philosophy of mind to embrace this domain; at the same time that we do not

presume to draw the dividing lines which nature still conceals, and possibly always will, nor attempt in a spirit of dogmatism to settle the great questions which can be approached only through the most patient and extended toil.

# VIII

## THE ORIGIN OF VOLITION IN CHILDHOOD [1]

In earlier articles of this series [2] I have endeavored to trace the development of the child's active life up to the rise of volition. The transition from the involuntary class of muscular reactions to which the general word "suggestion" applies, to the performance of actions foreseen and intended occurs, as I have before intimated, through the persistence and repetition of imitative suggestions. The distinction between simple imitation and persistent imitation has already been made and illustrated (the "try-try-again" experience). Now, in saying that volition — the conscious phenomenon of willing — arises genetically on the basis of persistent imitation, what I mean is this: that *the child's first exhibition of volition is its repeated effort to imitate movements seen, noises heard, &c.*

An adequate analysis of will with reference to the fiat of volition reveals three great factors for which a theory of the origin of this function must provide. These three elements of the volitional process are desire, delibera-

[1] From *Science*, Nov. 18, 1892. The theory of the rise of volition here announced was presented in detail at the International Congress for Experimental Psychology which met in London in August, 1892; a full abstract is to be found in the Proceedings of the Congress. It is worked out in detail in my *Mental Development in the Child and the Race*, chap. xiii.

[2] "Suggestion in Infancy," *Science*, Feb. 27, 1891; "Infants' Movements," *Science*, Jan. 8, 1892 (now incorporated in *Mental Development*).

tion, and effort. Desire is distinguished from impulse by its intellectual quality, *i. e.*, the fact that it always has reference to a presentation or pictured object. Organic impulses may pass into desires — when their objects become conscious. Further, desire implies lack of satisfaction of the impulse on which it rests — a degree of inhibition, thwarting, unfulfilment. Put more generally, these two characteristics of desire are: (1) a pictured object suggesting a satisfaction which it does not give, and (2) an incipient motor reaction which the imaged object stimulates but does not discharge.[1]

The first clear cases of desire — as thus understood — in the life of the child are seen in the movements of its hands in grasping after objects seen. As soon as there is clear visual presentation of objects we find impulsive muscular reactions directed toward them, at first in an excessively crude fashion, but becoming rapidly refined. These movements are free and uninhibited — simple sensori-motor suggestive reactions. But I find, in experiments with my children, that the more or less random at grasping objects, which prevailed up to about the sixth month, tended to disappear rapidly in the two subsequent months — just about the time of the rise of imitation. During the eighth month, my child, H., would not grasp at highly-colored objects more than sixteen inches distant, her reaching distance being ten to twelve inches.[2] This training of impulse is evidently an association of muscular sensations in the arm with visual experiences of distance. The suggested reaction becomes inhibited in a growing degree by a counteracting nervous process; and here are the conditions necessary to the

[1] In my *Handbook of Psychology*, vol. ii., chap. xiv., § 2, there is a fuller development.

[2] See *Science*, xvi., 1890, p. 247 (*Mental Development*, chap. iii.).

rise of desire. It is safe, indeed, I think, to say that *desire takes its rise in visual suggestion and develops under its lead.*

The two further requisites to the process of volition are deliberation and effort. The word "deliberation" characterizes the content of consciousness, and may be best described as a state of polyideism, or relatively unreduced plurality of presentations, with a corresponding plurality of motor tendencies (motives). The feeling of effort seems to accompany the passage of consciousness into a monoideistic state after deliberation. It arises just when an end is put to the motor plurality by synthesis or co-ordination. Deliberation may exist without effort, as is seen in deliberative suggestion and in pathological aboulia, in which a man is a prey to incoördinated impulses.

Now these further conditions of the rise of volition are present in childhood in persistent imitation, the try-try-again experience. In the pre-imitative period, the so-called efforts of infants are suggestive reflexes. My child, E., strained to lift her head in the second month when any one entered the room; and in her fourth month, after being lifted by the clasping of both her hands around her mother's fingers, the mere sight of fingers extended before her made her grasp at them and attempt to raise herself. Such cases — on which many writers rely, as does Preyer — fall easily under sensori-motor suggestion as it borders on physiological habit. The nearest it comes to volition is that it may involve faint glimmerings of desire, but it certainly lacks all deliberation. Further, simple imitation can be readily accounted for without any appeal to deliberation or effort and even without an appeal to desire.

In persistent imitation we have an advance on simple

imitation in two ways: (1) A comparison of the first result produced by the child (movement, sound) with the suggesting image or "copy" imitated, *i. e.*, deliberation. This gives rise to the state of dissatisfaction, motor restlessness, which is desire, best described as "will-stimulus;" (2) the outburst of this complex motor condition in a new reaction, accompanied in consciousness by the attainment of a monoideistic state (end) and the feeling of effort. Here, then, in persistent imitation we have, thus briefly put, the necessary elements of the volitional psychosis.

The reason that in imitation the material for volition is found is seen to be that here a certain "circular process" maintains itself. In reactions which are not imitative (for example, an ordinary pain-movement reaction) this circular process, whereby the result of the first movement becomes itself a stimulus to the second, etc., is not brought about; or, if it does arise, it consists simply in a repetition of the same motor event fixed by association — as the repetition of the *ma* sound so common with very young infants. Consciousness remains monoideistic. But in imitation the reaction performed comes in by eye or ear as a new and different stimulus; here is the state of motor polyideism necessary for the supervention of the feeling of effort.

From this and other lines of evidence,[1] we are able to see more clearly the conditions under which effort arises. It seems clear that (1) the muscular sensations arising from a suggestive reaction do not present all the conditions; in young children, just as in habitual adult performances, muscular sensations simply give a repetition

[1] Other evidence is (*a*) a research on students, called "Persistent Imitation Experiment," and (*b*) evidence from the pathology of speech (both given in *Mental Development in the Child and the Race*).

of the muscular event. The kinæsthetic centre empties into a lower motor centre in some such way as that described by James (*Psychology*, II., p. 582) along the diagonal line *mc*, *mp* in the "motor square" diagram given below (Fig. 1). This is also true when (2) sensations of the "remote" kinæsthetic order (the sight or hearing of movements made) are added to the muscular

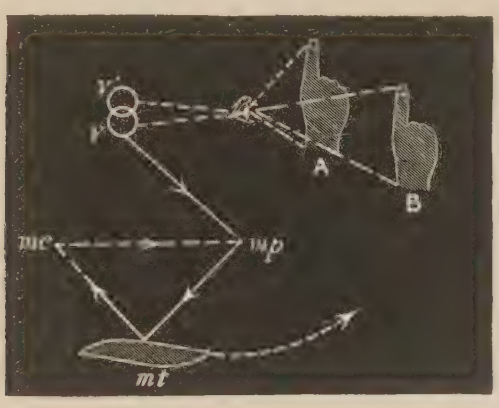



FIG. I. — *Simple Imitation.* $v, v'$ = visual seat; $mp$ = motor seat; $mt$ = muscle moved; $mc$ = muscle-sense seat; $A$ = "copy" imitated; $B$ = imitation made. The two processes $v$ and $v'$ coalesce and the reaction is repeated without change or effort.

sensations. They may all coalesce to produce again a repetition of the original reaction. The "remote" and "immediate" sources of motor stimulation reinforce each other. This is seen in a child's satisfied repetition of its own mistakes in speaking and drawing, where it hears and sees its own performances. Consequently (3) there is muscular effort only when the "copy" persists and is compared with the result of the first reaction; that is, on the physical side, when the two processes

started by the "copy" and the reactive result reach the higher co-ordinating centre together. The stimulus to repeated effort arises from the lack of co-ordination or identity in the different stimulations which reach the centre of co-ordination simultaneously. The mental outcome, effort, accompanies the motor outburst of these combined influences, and, so soon as this outburst reproduces the "copy," the effort is said to "succeed," the subject is satisfied, "will-stimulus" disappears, and the reaction tends to become fixed as habit.

Physiologically the point which distinguishes persistent imitation with effort from simple imitation with repetition is this conflict of processes in the centre. In simple imitation the excitement aroused by the reaction, as its result is reported inwards by the eye or ear, finds no outlet except that already utilized in the first discharge; hence it passes off in the way of a repetition of this discharge. See Fig I.

In persistent imitation the first reaction is not repeated. Hence we must suppose the development, in a new centre, of a function of co-ordination by which the two regions excited respectively by the original suggestion and the reported reaction coalesce in a common more voluminous and intense stimulation of the motor centre. A movement is thus produced which, by reason of its greater mass and diffusion, includes more of the elements of the "copy." This is again reported by eye or ear, giving a "remote" excitement, which is again co-ordinated with the original stimulation and with the after effects of the earlier imitations. The result is yet another motor stimulation, or effort, still of great mass and diffusion, which includes yet more elements of the "copy." And so on, until simply by its increased mass — by the greater range and variety of the motor elements enervated —

the "copy" is completely reproduced. The effort thus succeeds. See Fig. II.

When muscular effort thus succeeds by the simple fact of increased mass and diffusion of reaction, the useless elements fall away because they have no emphasis. The desired motor elements are reinforced by their agreement with the "copy," by the dwelling of attention upon

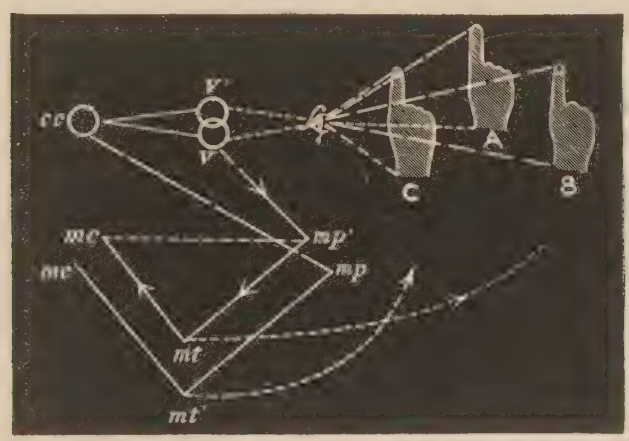



FIG. II. — *Persistent Imitation with Effort.* *C* = successful imitation; *cc* = co-ordinating centre. (Other letters same as in Fig. I.) The processes at *v* and *v'* do not coalesce but are co-ordinated at *cc* in a new reaction *mp'*, *mt'*, which includes all the elements of the "copy" (A) and more. The useless elements then fall away because they are useless and the successful act is established.

them, by the pleasure which accompanies success. In short, the law of survival of the fittest by natural, or, in this case "functional," [1] selection assures the persistence of the reaction thus gained by effort.

This theory of the physical process underlying volition is not open to the objections commonly urged against

[1] The term "Functional Selection" is applied to this process in my *Mental Development*, 2d ed.

earlier views. How can we conceive the relation of mind and body? The alternatives heretofore current are three: either the mind interferes with brain processes, or it directs brain processes, or it does nothing — these are the three. Now, on the view here presented, none of these is true. The function of the mind is simply to have a persistent presentation — a suggestion, a "copy." The law of sensori-motor reaction does the rest. The muscles reflect the influence of the central excitement; this creates more excitement, which the muscles again reflect; and so on until, by the law of "overproduction," which nature so often employs, the requisite muscular combination is secured [1] and persists.

Further, a direct examination of the infant's earliest voluntary movements shows the growth in mass, diffusion, and lack of precision which this theory requires. In writing, the young child uses not only hand, or hand and arm, or hand, arm, tongue, face, but, with these, his whole body. In speaking, also, he "mouths" his sounds, screws his tongue and hands, etc. And he only gets his movements reduced to order after they have become by effort massive and diffuse. I find no support whatever, in the children themselves, for the current view of psychologists, *i. e.*, that voluntary combinations are gradually built up by adding muscle to muscle and group to group. This is true only after each of these elements has itself become voluntary. Such a view implies that the infant

[1] This application of the principle of "selection" to muscular movement is so simple a solution of this crucial problem that I fear I must have overlooked some suggestion of it in the literature of the subject. At any rate, the tracing of it in the phenomena of imitative suggestion has not occurred elsewhere. As a general hypothesis, however, it is independent of the question as to whether volition is first found in imitation. It is now (1902) confirmed by experimental evidence; see especially Ll. Morgan, *Habit and Instinct*, and Bair in *Psychological Review*, Sept., 1891.

at this stage knows that he uses his muscles, which is false; knows which muscles he has learned to use, which is also false; and is able to avail himself of muscles which he has not learned to use, which is equally false — not to allude to the fact that it leaves suspended in mid-air the problem as to how the new conbination intended gets itself carried out by the muscles.

It is evident, also, that in accounting for the earliest voluntary movements as cases of persistent imitative suggestion, we are making the presentation which constitutes the "copy" a thing imported into consciousness, a "suggested" thing which is imposed upon the infant by the necessities of its receptive nature. So it seems to be.[1] Whether and how the mind ever gets away from this chain of suggestions or "copies," selects its own "copy" or end, and secures by its own choice the persistence of it — this is the question of voluntary attention. Its consideration would lead us too far afield from our present topic, the babies.

[1] It is possible that earlier obscure volitions might arise from the conflicts of native impulses, if the complex conditions, as explained above, were realized.

# IX

## IMITATION: A CHAPTER IN THE NATURAL HISTORY OF CONSCIOUSNESS[1]

IMITATION is a matter of such familiarity to us all that it goes usually unattended to; so much so that professed psychologists have left it largely undiscussed. Whether it be one of the more ultimate facts or not, suppose we assume it to be so; let us then see what we can explain by it, and where we may be able to trace its influence in the developed mind.

§ 1. We may make it a part of our assumption — what I have endeavored to prove elsewhere[2] — that an imitation is an ordinary sensori-motor reaction which finds its differentia in the single fact that it imitates: that is, its peculiarity is found in the locus of its muscular discharge. It is what I have called a "circular activity" on the bodily side — brain-state due to stimulus, muscular reaction which reproduces the stimulus, same brain-state again due to same stimulus, and so on. The questions to be asked now are: where in our psycho-

[1] From *Mind*, Jan., 1894. This paper gives, in a summary way, some of the positions developed further in the volume entitled *Mental Development in the Child and the Race*, already referred to. It is now reprinted both as serving the purpose of a *résumé* and also as being the first presentation of some of the views developed in that work (and also in the later volume, *Social and Ethical Interpretations*, 3rd ed., 1902). The numbered paragraphs are retained, as in the original publication, to mark the more abrupt transitions.

[2] *Science* (N. Y.), 1891, p. 113. *Cf.* the paper just preceding this.

physical theory do we find place for this peculiar "circular" order of reaction? — what is its value in consciousness and in mental development? — and how does it itself arise and come to occupy the place it does?

If the only peculiarity about imitation is that it imitates, it would follow that we might find imitations wherever there is any degree of interaction between the nervous organism and the external world. The effect of imitation, it is clear, is to make the brain a "repeating organ"; and the muscular system is, so far as this function goes, the expression and evidence of this fact. The place of imitation in life development is theoretically solvable in two ways, therefore: (1) by an examination of organisms and minds for actual imitations, and (2) by the deduction of this function from the theory of repetition in neurology and psychology — this latter provided we find that nature does not herself present enough *de-facto* repetitions to secure the development of body and mind. If this latter condition be unfulfilled — that is, if nature does actually repeat her stimulations, light, sound and so forth, sufficiently often and with sufficient regularity to secure nervous and mental development — then imitation is probably a side phenomenon, an incident merely.

Without taking either of these questions in the broadest sense, I wish, while citing incidentally cases of the occurrence of imitation, to show the importance of repetitions and of the imitative way of securing repetitions, in the progress of mind.

§ 2. If it be true, at the outset, that organic development proceeds by reactions, and if there be the two kinds of reaction usually distinguished, *i. e.*, those which involve consciousness as a necessary factor and those which do not, then the first question comes: in which of these

categories do imitative reactions fall? Evidently in large measure in that involving consciousness. If we further distinguish this category in so far as it marks the area of conscious life which is "plumb up," so to speak, against the environment — directly open to external stimulation — by the word "suggestion," we have thus marked off the most evident surface features of imitation. Imitation is then, so far, an instance of suggestive reaction.[1]

§ 3. Now let us look more closely at the kind of consciousness, and find its analogies. A mocking bird imitates another, a beaver imitates an architect, a child imitates his nurse, a man imitates his rector. Calling the idea of the result, as we look at the result (not as the imitator may or may not look at it), the "copy," we find that we are forced to consider the psychological elements involved very different in these four cases.

[1] It is not necessary, I think, to discuss in detail the meaning of this much-discussed but, in the main, very well-defined word — "suggestion." I have myself defined suggestion as "from the side of consciousness . . . the tendency of a sensory or an ideal state to be followed by a motor state" (*Science, loc. cit.*), [when this is] "typified by the abrupt entrance from without into consciousness of an idea or image (or a vaguely conscious stimulation) which tends to bring about the muscular or volitional effects which ordinarily follow upon its presence" (*Handbook of Psychology*, ii. 297). Janet says it is "a motor reaction brought about by language or perception," *Autom. Psych.*, p. 218; Schmidkunz: "die Herbeirufung eines Ereignisses durch die Erweckung seines psychischen Bildes," *Psych. der Sugg.*; Wundt: "Suggestion ist Association mit gleichzeitiger Verengerung des Bewusstseins auf die durch die Association angeregten Vorstellungen," *Hypnotismus u. Suggestion*, Abs. ii.; Ziehen: "In der Beibringung der Vorstellung liegt das Wesen der Suggestion," *Philos. Monatschefte*, xxix., 1893, p. 489. It is so marked a fact in current theory, especially on the pathological side, that I have found it convenient to use a special phrase for consciousness when in the purely suggestible condition, *i. e.*, "reactive consciousness" (*loc. cit.* pp. 60 ff., and chap. xii.). The phrase "conscious reflex" is not good as applied to these suggestive reactions; for they are cortical in their brain seat, and are not as definite as ordinary reflexes.

This copy as defined in our minds, we are forced to think, is also clearly defined in the mind of the man, it is rudely defined in the mind of the child, it is not defined at all in the mind of the mocking bird, and in the mind of the beaver it is something else which is defined, and rudely. These cases are ordinarily distinguished by mutually exclusive words, *i. e.*, in order: volition, suggestion, reflex reaction, instinct. Yet this one thing they do have in common, a constructive idea which we see objectively, and which each, in its result, repeats. It will be profitable to inquire into the origin and significance of this "copy" in each of these cases.

§ 4. In the case of simple imitative suggestion we find what seems to be the most evident and schematic type. Here we have a simple visual or auditory copy stimulating the mind and the organism to a reaction which repeats the copy. But we find other reactions side by side with it which do not repeat a copy. Psychologists classify these reactions under the heads of instincts, impulses, reflexes, volitions. Now it is not making very great assumption in view of current theories, to hold that imitations if repeated may become reflex (reflex speech, reading, writing, etc., for example), nor to hold that reflexes when repeated and consolidated, become instincts either by heredity or by "coincident" variation which duplicates them in the next and following generations;[1] nor yet again to hold that instincts when snubbed, contradicted, and disused, are

[1] While remaining neutral here as respects the "inheritance of acquired characters," I may add that the negative opinion — represented by the "coincident variation" view of the text — is my mature opinion. See the theory of "Organic Selection" developed in the volume *Development and Evolution* (1902). A summary statement will be found in the *Dict. of Philosophy*, art. "Organic Selection."

broken up into impulses. Then impulses consciously indulged, ratified, and repeated, in opposition to snubbing, evidently become volitions. If we did find it possible, at present, to admit these assumptions, and to give names to the two processes involved, calling the "repeating" process the *law of habit*, and the "snubbing" process the *law of accommodation*, we would have a suggestive line of thought based upon what is actually the state of things in the most advanced neurology. Yet we must not forget that both these principles are in operation at once, and we have a possible twofold derivation of each term in the series. For example, looked at from the point of view of accommodation, to the environment as Ziehen points out, impulsive actions are due to the breaking up of instincts; but on the side of habit, or repetition, they represent volitions.[1]

Now let us see how in these several cases we can account for the reaction. In the case of simple suggestive imitation, the copy is in consciousness for reproduction, and is reproduced. How does this come about?

§ 5. Suppose at first an organism giving random reactions, some of which are useful; now development requires that the useful reactions be repeated, and thus made to outweigh the reactions which are damaging or useless. Evidently if there are any among the useful reactions which result in an immediate duplication of their own stimulus, these must persist, and on them must rest the development of the organism. These are the imitative reactions. Thus it is that an organism

[1] Imitation is a "mode [of action] whereby intelligence may change or deflect an instinct . . . it is true that the initial stage of such deflection occurs in the 'original ideas'" [what are called "copies" in this paper] (Romanes, *Mental Evolution in Animals*, p. 219). For the present writer's fuller views on the origin of instinct, see *Development and Evolution* and, for a popular account, the little book *Story of the Mind*, chap. iii.

once endowed with the reacting property might so select its stimulations as to make its relations to its environment means to its own progress; and imitative reactions, as now defined, would be one method to such selection.

This, it is plain, assumes consciousness in such an organism; for it is difficult to see how a reaction which reproduces its own stimulus in an exact mechanical way could ever begin, or ever stop when begun; that is, how it would differ from a self-perpetuating whirlwind, or from an elastic ball forever rebounding between two equal resistances. This last we do find in certain cases,[1] but inasmuch as such reactions are self-repeating, they do not present any law of development, and so approximate to a state of things in which consciousness might be conceived to be absent. At any rate, I find it more philosophical to make consciousness as original as anything else, and to hold with Lewes that living organisms are always conscious.[2]

§ 6. Development begun on this basis could only proceed if two requisites were fulfilled: first, the reaction which maintains itself must persist, and second, there must be a constant creation of new copies. The first means consolidation of tissues, a law of increasing fixedness in nerve processes, tending to give rise to great

[1] So with the endless repetitions of the same sounds by young children and parrots. Continued muscular tension kept up by circular discharge, until nervous exhaustion ensues, is characteristic also of the cataleptic condition.

[2] To be sure it may be said that an organism cannot in any case be compared with such a self-repeating mechanical device (say a swinging pendulum), from the facts that it gets *exhausted* and it *grows*. This is true, and for this very reason I am unable to accept the purely chemical doctrine of life which Verworn states in the theory spoken of subsequently (§ 8, below). But why may not consciousness be the "something" which secures (or at least evidences) growth, or exhaustion?

functional habits, which at any stage of progress represent the acquired functions of the organism and its degree of adaptation to the environment. But, how is this persistence possible in the absence of the objective stimulus? Evidently it is not possible, unless there be some way whereby the energies of the reaction in question may be started by something equivalent to the working of the original external stimulus. This is accomplished in the organism by an arrangement whereby a variety of copies conspire, so to speak, to " ring up " one another. When an external stimulus starts one of them, that starts up many others in a series, and all the reactions which wait upon these copies tend to realize themselves. Thus the great practised habits of the organism are confirmed by stimulation again and again, while the increasing variety of the conspiring copies — constantly recruited from the new experiences of the world — make up a large and ever larger mass of elements, or centres, which vibrate in delicate counterpoise together.

§ 7. Of course it is evident that the arrangement thus sketched is the physical basis of memory. A memory is a copy for imitation taken over from the world into consciousness. Memory is a device to nullify distance in space and time. It remedies lack of immediate connection with the accidental occurrences of the world. Every act I set myself to do is either to imitate something which I find now before me, or to reproduce, by making objective to myself, something whose elements I remember — something whose copy I find set within me by a " ring up " from elements which are in immediate connection with what is now before me.[1]

[1] The psychology of lying becomes clear when we remember that a lie is the emphasis of a " copy " just as truth-telling is. In children about two years old, truth or falsehood hangs largely upon the question what

§ 8. The theory so far advanced, with extreme brevity, is in accord with that first announced (obscurely I think) by Tarde.[1] Tarde's theory is improved, in quotation, and endorsed by Sighele.[2] It may be analyzed into two factors, *i. e.* (*a*), the securing of repetitions by imitation, and (*b*), the theory of memory considered as a means of perpetuating and increasing the effects of repetition, in mental development, by the formation of habits. This latter moment I find only vaguely and inadequately stated by Tarde. Further, M. Tarde's view assumes the fact of imitation, makes of it an original endowment or instinct, and is, in so far, open to the objections which may be urged (*cf.* Bain, *Senses and Intellect*, 3rd ed., pp. 413 ff., taken up below, § 28) against such a view. The theory which I am now proposing supplies this lack: it gives a derivation of imitation based upon an analysis of the imitative reaction itself. This analysis — the outcome of which I have expressed by calling imitation a "circular reaction," *i. e.*, one which repeats its own stimulus — gives us a means of defining imitation and fixing the limits of the concept (below § 26).[3] The third and fundamental factor, therefore, which the development stated above endeavors to supply, is the rise of imitation from simple contractility under two concurrent agencies: (1) the occurrence, among the "spontaneous variations" of discharge,

copy elements come up first. Before he has learned to apply the tests to his images by which true memories are distinguished, the child simply reacts upon the images that are there, no matter where they come from.

[1] *Les Lois de l'Imitation*, chap. iii.; published earlier in an article "Qu'est ce qu'une Société," *Revue Philosophique*, xviii., 1884, p. 489. My views are, however, though in accord with, not the same as M. Tarde's — a matter which is spoken of in *Social and Ethical Interpretations.*

[2] *La foule criminelle*, pp. 42 ff.

[3] *Cf.* Tönnies, *Philosophische Monatshefte*, 1893, p. 298, on the necessity for definition in this field.

of movements which secure at once the repetition of the first stimulus, and (2), the continuance of such of these self-repeating reactions as are useful (pleasurable). Those which are damaging (painful) or useless, by that very fact, lower the vitality of the organism and so hinder their own recurrence. This derivation of imitation secured, we are able to develop independently the two principles urged by Tarde and Sighele, as follows in this paper.

This derivation of imitative reaction is in line, I think, with the most important and thorough contributions lately made to the theory of organic movement — so far as one who is not a professed biologist is entitled to an opinion. Two recent investigators have summed up evidence which supplies in great part the basis long desiderated for a theory of muscular action and development. Eimer[1] has stated the facts which make it probable that all the "morphological properties of muscle are the result of functional activity." On this view contraction waves leave markings which account for both muscle-fibres and striation. The series of stages in the development of voluntary muscle which biological science is now cognizant of, is very striking. That there are no anatomical divisions corresponding to the striation of muscle is shown by recent observations. It remains, then, only to find a physiological conception of contraction which, while applicable primarily to unicellular creatures, provides for the development of the organism and the differentiation of its parts. Natural history requires, in the words of Engelmann, that "every attempt to explain the mechanism of protoplasmic movement must extend to all the other phenomena of con-

[1] *Zeitschrift für wissen. Zoologie*, liii. suppl. Bd. p. 67.

tractility."[1] This requirement the theory of contractility of Max Verworn seems to me to go far towards supplying, accordant as it is with the detailed results of Kühne, Schultz, Engelmann, and others. The outcome of Verworn's work is a chemical theory of contractility which rests upon two known cases of chemical action.[2] Kühne has proved that the oxygen of the air supplies a want to the outer layer of particles of a protoplasmic mass. The elements set free by this union find themselves impelled toward the centre by their affinity for the nuclear elements; this new synthesis releases elements which again move outward toward the oxygen at the surface.[3] Thus there are two contrary movements: away from the nucleus, or expansion, and toward the nucleus, or contraction. Considering the oxygen-action as stimulus, we have thus a reaction which repeats its own stimulus and thus perpetuates itself. This is just the type of reaction which our circular theory, as outlined above, requires. Verworn pushes the claim of this type of vital action right up through all the forms of muscular action — just as Eimer finds only the one type of function necessary to account for all the morphological variations. I am certainly, therefore, within the bounds of biological evidence in claiming that the imitative type of reaction is very early in biological order and significance; and especially so if it be found, as this paper endeavors to hold, that the progress of consciousness can be accounted for in stages corresponding in its great

[1] Quoted by Soury, *Revue Philosophique*, July, 1893, p. 45.

[2] *Die Bewegung der lebendigen Substanz* (Jena, 1892). Verworn's work is summarized by Soury (see last note). See Burdon Sanderson's remarks on "Chemiotaxis" in *Nature*, Sept. 14, 1893, p. 471.

[3] The exhaustion of the nucleus by stimulation is shown by the work of Hodge, *Changes due to Functional Activity of Nerve Cells* (1893).

features with the stages of differentiation required by the physiological and anatomical theories.[1]

The concomitance of higher and lower instances of the one "circular reaction" is seen in the voluntary contraction of a muscle because an act is pictured, desired, and imitated, on the one hand, and on the other hand, in the continued rhythmical performance of the same act automatically.[2]

§ 9. For example — resuming our analysis of consciousness: — you speak a word; I at once write it. To-morrow, by reason of a brain lesion, I am unable to write the word when I hear you speak it, but I can still copy the word when you set it before me. The lesion has simply deprived me of the use of my internal visual copy by cutting the writing-reaction apparatus off from its connection with the auditory seat from which this visual copy was accustomed to be "rung up." But the simpler imitation of the external visual copy remains possible. A step further: I see a man and at once write his name. Here the visual image of the man rings up the auditory image of the name-word, this rings up the visual copy-image of the written word, and this I imitate by writing. If any one had asked me why I wrote the man's name, I would have said: "Because I remembered it." But each one of these images is itself a "copy," when needed for its own appropriate reaction. A young child, on seeing the man, would say "Man;" that is, he would imitate the auditory copy which the sight of the man rang up. And a certain

[1] It should be said, however, that the early presence of reactions of the "circular" kind does not depend upon the truth of this particular physiological theory (of the action of oxygen).

[2] See Chauveau on "The Sensori-motor Nerve Circuit of Muscles" in *Brain*, 1891, pp. 145 ff., and Exner on "Senso-mobilität" in *Pflüger's Archiv*, xlviii., 592 ff.

child of mine would probably hasten to ask for a pencil in order to draw the man, that is, to imitate the schematic outline of man fixed in her memory by earlier efforts to imitate the external thing.

§ 10. The question as to how the different "copies" come to ring one another up, in such a system, is the question of association. They can at first act together only so far as the original external copies are together. In other words, association by contiguity is simply the transfer of external togetherness into internal togetherness. But suppose a present external copy rings up another copy which is only internal: why is this? Evidently because there are some other elements of copy either external or internal which have been together with both: this is association by resemblance or contrast. For example: your spoken word brings up my written word-copy. Why? Because sound and written copy existed together when I learned to write. Again, "man" seen brings up "name written." Why? Because "man seen" and "name heard" were present together when I learned to speak, and afterwards "name heard" and "name written" were present together when I learned to write. So "name heard" is the common element of copy.

§ 11. Reflection convinces us that we have now reached a principle of wide-reaching application in mental development. We see how it is possible for reactions which were originally simple imitative suggestions to lose all appearance of their true origin. Copy-links at first distinctly present as external things, and afterwards present with almost equal distinctness as internal memories, may become quite lost in the rapid progress of consciousness. New connections are established in the network of association, and motor dis-

charges are stimulated thus which were possible at first only by imitation and owed their formation to it. A musician plays by reading printed notes, and forgets that in learning the meaning of the notes he imitated the movements and sounds which his instructor made; but the intermediate copies have so fallen away that his performance seems to offer no surface imitation at all. His copy-system for sound persists, of course, to the end to guide his muscular reactions. But a musician of the visual type goes further. He may play from memory of the printed notes; that is, he may play from a transplanted visual copy of notes which themselves are but shorthand or substitute expressions of earlier sound and muscular copies, and finally the name only of a familiar selection may be sufficient to start a performance guided only by a subconscious muscular copy series. If this principle should be proved to be of universal application we would then be able to say that every intelligent action is stimulated by copies whose presence the action in question tends to reproduce.[1]

§ 12. Returning to the earlier question of the origin of instinct and impulse, I venture to suggest — subject to criticism and in the face of apparent paradox — that both of them are explainable by this principle of modified and compounded imitations. The bird's nest-building instinct is probably the native carrying-out of an adaptation which was at first carefully copied and has now been reproduced by variation, so that the direct fragmentary reactions upon the present world combine

[1] It is easy to see that the whole psychological theory of muscular control, whether central or peripheral in its seat, requires the production by the reaction of a sensation series which matches or repeats a copy series; and inhibition in general represents the limitations which older structures and dispositions impose upon new reactions — they must conform if possible to old organic "copy."

to make up the copy-whole which is our "idea" and the bird's creation. Likewise impulse is the trunk, the torso, of a reaction which has lost its copy and so failed to maintain itself in full operation — fully useful once, but now restricted and superseded by more complex activities. We have impulses and the animals have instincts because we have left the animals behind and by our rational volitions realize compounds of activity which instincts at their best only ape. In the insane asylums may be seen men in whom both the appearance of "idea," preserved in the animals by the equilibrium of instincts, and as the prevision characteristic of human choice, are absent; and in these persons impulse, free from both checks, plays itself out in fragmentary and destructive action. Like little children, before the training of volition, such patients learn only by imitation.

§ 13. Accommodation, then, is the principle by the action of which, in the constant exercise of circular reaction, new adaptations are acquired, and the system of copies to which it is the end of our actions to conform, is indefinitely recruited.

§ 14. Continued accommodation is possible only because the other principle, *habit*, all the time conserves the past and gives *points d'appui* in solidified structure for new accommodations. Inasmuch, further, as the copy by transference from the world to the mind in memory, becomes capable of internal revival, accommodation takes on a new character — a conscious subjective character — as *volition*. Volition arises typically as a phenomenon of "persistent imitative suggestion," as I have argued in some detail elsewhere.[1] That is, volition

[1] *Proceedings of Congress of Experimental Psychology*, London, 1892, pp. 49 ff.; the paper immediately preceding, in this volume.

arises when a copy remembered vibrates with other copies remembered or presented, and when all the connections, in thought and action, of all of them are together set in motion incipiently. The residue of motive is connected with what we call attention,[1] and the final co-ordination of all the motor elements involved is volition, with choice. The physical basis of memory, association, thought, is also that of will — the cerebrum — and pathological cases show clearly that aboulia is fundamentally a defect of synthesis in perception and memory,[2] arising from one or more breaks in the copy system whose rise has been sketched in what precedes.

§ 15. There are several aspects of presentation and representation which offer less difficulty when brought into connection with our present topic. Recent discussions clearly show not only the possible dominance in consciousness of a copy-image so strong and habitual as to assimilate new experiences to its form and meaning; but also that this assimilation is the very mode and method of the mind's digestion of what it feeds upon. Consciousness constantly tends to neglect the unfit, the *mal apropos*, the incongruous, and to show itself receptive to that which in any way conforms to its present stock. A child after learning to draw a full face — circle with spots for the two eyes, nose, and mouth, and projections on the sides for ears — will persist, when copying a face in profile, in drawing the circle with two eyes and two ears, failing to see the error, although only one ear is visible and no eyes.[3] The external

[1] For an analysis of the relation of Reflex attention to sensation and movement, see chap. xiv., in *Mental Development*.

[2] *Cf.* Janet, "Un cas d'Aboulie, &c.," in *Revue Philosophique*, March and April, 1891.

[3] *Cf.* Passy's interesting observations in *Revue Philosophique*, 1891, ii, 614.

pattern is assimilated to the memory copy. The child has a motor reaction for imitating the latter; why should not that answer for the other as well? As everybody admits, in one way or another, such assimilation is at the bottom of recognition, and of illusions, which are mostly mistaken recognitions.

§ 16. Passing on to the sphere of conception and thought, we find a remarkable opening for the law of imitation. The principle of Identity which represents the mental demand for consistency of experience, and the mental tendency, already remarked, to the assimilation of new material to old schemes, is seen genetically in the simple fact that repetitions are normal everywhere in mental life because of the law of habit in its reactions. Just in so far as a new experience repeats an old one, to this degree it accomplishes what motor imitation would have accomplished, and makes future repetitions easier. To say that identity is necessary to thought, therefore, is only to say that it expresses in a generalization the method of mental development by imitative reaction. Identity is the formal or logical expression of the principle of Habit.

§ 17. The principle of Sufficient Reason is subject to a corresponding genetic expression, on the side of Accommodation. Sufficient reason, in the growing mind, is an attitude, a belief; anything in its experience which tends to modify the course of its habitual reactions in a way which it must accept, endorse, believe — this has its sufficient reason, and it is accommodated to by imitation. I have argued elsewhere that a conflict between the established, the habitual, the taken for granted, the identified, on one hand, and the unidentified and unassimilated, on the other hand, is necessary to belief. Belief arises in the child in the readjustment of himself

actively to new elements of reality. In so far as there is truth in this view, in so far does Sufficient Reason become a formal or logical statement of the fact of accommodation. Put more broadly: whenever we believe a new thing or accept its existence, we accommodate our attitude to its presence, we make place for it in our store of acquisitions for future use; this means that we are prepared to reproduce it voluntarily and involuntarily, to make it a part of that copy system which hangs together in our memory as representing a consistent course of conduct and the best adjustment we have been able to effect to our physical and moral environment.

Imitation is then the method by which our living *milieu* in all its aspects gets carried over and reproduced within us. The dynamic relationships of the elements of this reproduced world supply to us our sufficient reason. Our accompanying sense of acceptance and endorsement of these copies by our own action is belief; and the familiarity which repetition engenders betokens the growth of habit and the recognition of identities.

§ 18. Conception proceeds by identities and sufficient reasons: and we get in this connection a genetic view of the active basis of the "general" notion. The child begins with what seems to be a general. His earliest experiences, carried over into memory, become general copies which stand as assimilative nets for every new event or object. All men are "papa," all colors are "wed," all food "mik." What this really means is that the child's motor attitudes are fewer than his receptive experiences. Each experience of man calls out the same attitude, the same incipient movement, the same coefficient of attention on his part, as that with which he hails "papa." In other words, each man is a repetition of the papa-copy and carries the

child out in action, just as his own imitative response to the papa-copy would have carried him out. But of course this does not continue. By accommodations, by experiences which will not assimilate, this tendency to habit is in part counteracted, his classes grow more numerous as his reactions do, his general notions more "reasonable," and he is on the proper road to a "rectification of the concept."

§ 19. Again, in the affective life we find evidence of the working of the imitative principle. The production of emotion depends upon the reinstatement by association or action of an ideal copy. Sympathy may be called, however, the imitative emotion *par excellence*. My child H. cried out when I pinched a bottle-cork in her fifth month, and wept bitterly, in her twenty-second week, at the sight of a picture of a man with bowed head and feet in stocks.[1] In such cases the presentation is assimilated to memory-copies of personal suffering, and so calls out the motor attitudes habitual to experiences of pleasure- or pain-giving objects. And the motor discharges — the emotional expressions — react to define and deepen the emotion itself. In many cases, however, I think, the associative order is the reverse. The presentation of the expression of emotion in another stimulates motor expression in us, and this in turn reacts to arouse the hedonic state which usually stimulates such a reaction. The two cases of sympathy in my child, given above, illustrate the truth of both these accounts.

§ 20. To speak of pleasure and pain for themselves — I see no way to find an absolute beginning for them anywhere in the course of mental development. If the

[1] The picture on p. 227 of Bissell's *Biblical Antiquities*.

reactive or contractile process began without consciousness, then no doubt pleasure and pain were the first and simplest form of consciousness when the conditions of its rise were present. But if consciousness was present from the first, and if development depended upon the repetition of useful reactions, then that which throughout the whole animal series and in man constitutes the index in consciousness of profit and loss and so serves as its selective criterion — pleasure and pain — must have had the same place and *rôle* then as now. Otherwise why should it be at all? Preferring the alternative which does not involve us in the question of the origin of consciousness — a preference for which more adequate reasons may be given in general philosophy — I think pleasure and pain must be held to be original accompaniments of vital reaction.[1]

§ 21. Our outcome then seems to be this, so far as the natural history conception is a valid one; mental development on its active side might be accounted for on the basis of imitative repetition solely — as defined in the phrase "circular reaction" — provided contrac-

[1] It is sufficient to suggest at this point that as far as psycho-physical theories of pleasure and pain have taken account of movement, as an element in mental development, they are in accord with the fundamental conception of this paper. Meynert (*Pop. wiss. Vorträge*, iii.) bases the distinction between pleasure and pain, in their genesis, upon the inner processes which minister respectively to outward movements (*Angriffsbewegungen*) and withdrawing movements (*Abwehrbewegungen*); and Münsterberg's recent suggestive experiments (*Proc. Cong. Exper. Psych.*, London meeting, p. 132; and *Beiträge*, Heft iv. pp. 216 ff.) bear in the direction of a similar distinction. It is clear that, in the main, outward movements, expansions, would be the stimulus-repeating, imitating, pleasurable movements; and withdrawing movements, contractions, would represent lessened vitality and so pain. *Rigor mortis* is contraction; and something similar is seen in unicellular creatures in the return to the spherical form when death comes.

tility and pleasure-pain [1] may be assumed to be original in the first manifestations of life.

§ 22. An interesting point comes to light when we ask the relation of these two factors to each other. If imitative function is anything like so fundamental as the foregoing account takes it to be — the means of selection among varied external stimulations — it becomes evident in what sense pleasure and pain can be called the "object" of the reaction. Pleasure and pain are seen to be the index of a change brought about by a function. The repetition of this function is desirable, and this is secured by further imitation. The pleasure is enhanced by this repetition which aims at securing the continual presence of the copy; that is to say, the pleasure accruing is something additional to the copy or "object" which the reaction aims at.

The observation of young children directly and plainly confirms the truth of this position. The child invariably reacts at first upon objects. Suggestion, serving as a principle of accommodation, works regardless of the pleasure or pain which it gives rise to. I have illustrated this elsewhere with concrete cases from infant life.[2] Romanes finds it in the animal world.[3] Pathology is full of striking illustrations of it. Further, the transition from this naïve suggestibility to the reflective consciousness in which pleasures and pains become considerations or ends, is marked in the life history of the infant. He learns to dally with his bottle, to postpone

[1] This leaves untouched the mysteries of reproduction and heredity over which the chemists and the philosophers are at war. See what is said about the limitations of the "natural history conception," below, § 29.

[2] *Mental Development*, chap. vi.

[3] "There is abundant evidence of one individual imitating the habits of another individual whether the action imitated be beneficial or useless." (*Mental Evolution in Animals*, p. 220.)

his enjoyment, to subordinate a present to a distant pleasure, by a gradual process of acquired self-control. He gradually grows out of his neutrality to be a conscious egoist; but fortunately he learns at the same time, or even earlier, the elements of conscious altruism as well.

In adult life it is undoubtedly true that we usually do things because we like to do them, but it is not always so. Just as the little child sometimes acts from mere suggestion, at the same time moved to tears by the anticipation of pain to result from it; so to the man a copy may be presented so strongly for imitation, it may be so moving by its simple suggestiveness, that he acts upon it even though it have a hedonic coloring of pain. The principle of accommodation requires that it be so, for otherwise there could be no development, except within the very narrow range of accidental discharge. No new adjustment or adaptation could be effected without risk of pain and damage. If the child never reacted in any way except those pleasurable ways guaranteed by his heredity or by his experience, how could he grow? So if we sought only what we have already tasted, how could new appetites be acquired?[1]

§ 23. There is another sphere of the operation of imitation into which we shall briefly enter — that of the social and moral. The growth of the notion of self is so important a genetic factor in social and moral life, that it may suffice to consider the influence of imitation in the development of the consciousness of self — an influence not sufficiently recognized.

One of the most remarkable tendencies of the very

[1] In the chapters on "Pleasure and Pain" in my *Handbook of Psychology* (ii., chaps. v. and xi.) I have pointed out that the "well-being" theory of pleasure and pain must be supplemented to include reference to *future* development.

young child in its responses to its environment is its readiness to recognize differences of personality. It responds to what I have elsewhere called "suggestions of personality."[1] As early as the second month it distinguishes its mother's or nurse's touch in the dark. It learns characteristic methods of being held and taken up, of patting, kissing, etc., and adapts itself by a marvellous accuracy of protestation or acquiescence to these personal variations. Its associations of personality come to be of such importance, that for a long time its happiness or misery depends upon the presence of certain kinds of personality-suggestion. Of course this indicates a kind of memory, and a reaction which imitates or seeks to reproduce useful and pleasurable experiences. But yet it is quite a different thing from the child's behavior towards things which are not persons. Things come to be, with some few exceptions which are involved in the direct gratification of appetite, more and more unimportant: they are subordinated to regular treatment or reaction. But persons become constantly more important, as uncertain and dominating agencies of pleasure and pain. The fact of movement by persons and its effects on the infant seem to be the most important factor in this peculiar influence; later the voice comes to stand for a person's presence, and at last the face and its expressions are equal to the person, with all its attributes.

I think this distinction between persons and things, between agencies and objects, is the child's very first step away from a personally neutral consciousness. The sense of uncertainty or lack of confidence grows stronger and stronger in its dealings with persons — an uncertainty contingent upon the moods, emotions, *nuances* of

[1] *Science, loc. cit.*

expression and shades of treatment of the persons around it. A person stands for a group of experiences quite unstable in its prophetic as it is in its historical meaning. This we may for brevity of expression, assuming it to be first in order of development, call the "*projective* stage"[1] in the growth of personal consciousness.

Further observation of children shows that the instrument of transition from such a "projective" to a subjective sense of personality is the child's active bodily self, and the method of it is imitation.

As a matter of fact, accommodation by actual muscular imitation does not arise in most children until about the seventh month — so utterly organic is the child before this, and so great is the impetus of its inherited instincts and tendencies. But when the organism is ripe, by reason of cerebral development, for the enlargement of its active range by new accommodations, then he begins to imitate. And of course he imitates persons. Persons have become his interesting objects, the source of his weal or woe, his uncertain factors. And further, persons are bodies which move. Among these bodies which move, which have certain projective attributes as described, a very peculiar and interesting one is his own body. It has connected with it certain intimate features which all others lack. Besides the inspection of hand and foot, by touch and sight, he has experiences in his consciousness which are in all cases connected with this body: strains, stresses, resistances, pains, etc., — an inner felt series along with the outer presented series. But it is only when a new kind of experience arises which we call effort — a set opposition to strain, stress, resistance,

[1] The use of this word seems to be necessary in order not to encroach upon the recognized meanings of the words *subjective* and *ejective*.

pain: an experience which arises, I think, first as imitative effort — that there comes that great line of cleavage in his experience which indicates, as I have said above, the rise of volition, and which separates off the series now first really *subjective*. Here is the first germinating nucleus of self-hood over against object-hood. Situations before accepted simply, are now set forward, aimed at, wrought; and in the fact of aiming, working, the fact of agency, is the sense of subject. The subject sense is an actuating sense. What has formerly been projective now becomes subjective. The associates of other personal bodies, the attributes which made them different from things, are now attached to the child's body with the further peculiarity of actuation. This I may call the *subjective* stage in the growth of the self-notion. It rapidly assimilates to itself all the other elements by which the child's own body differs in his experience from other active bodies: the passive inner series of pains, pleasures, strains, etc. The self suffers as well as acts. All get set over against lifeless things, and against living bodies which act but whose actions do not contribute to his own sense of actuation or of suffering.

Again, it is easy to see what now happens. The child's subject-sense goes out to illuminate these other persons. The projective is now lighted up, claimed, clothed on with the raiment of self-hood, by analogy. The projective becomes *ejective*, *i. e.*, other people's bodies, says the child to himself, have experiences *in them* such as mine has. This is the third stage, the *ejective*, or "social" self.[1]

[1] I think an adequate apprehension of the distinctions conveyed by the three words "projective," "subjective," and "ejective" would banish the popular "psychologists' fallacy" beyond recall.

The *ego* and the *alter* are thus born together. Both are crude and unreflective, largely organic, an aggregate of sensations prime among which are efforts, pushes, strains, physical pleasures and pains. And the two get purified and clarified together by this twofold reaction between project and subject, and between subject and eject. My sense of myself grows by imitation of you, and my sense of yourself grows in terms of my sense of myself. Both *ego* and *alter* are thus essentially social creations. For a long time the child's sense of self includes too much: the circumference of the notion is too wide. It includes the infant's mother, and little brother, and nurse, in a literal sense. To be separated from his mother is to lose a part of himself; as much so as to be separated from a hand or foot. And he is dependent for his growth directly upon these suggestions which came in for imitation from his personal *milieu*.

It will be seen by readers of R. Avenarius[1] that the two stages of this development correspond to the two stages in his process of *Introjection*, whereby the "hypothetical" (personal-organic) element of the *naturlichen Weltbegriff* is secured. Avenarius finds, from analytical and anthropological points of view, a process of attribution, reading-in (*Einlegung*), by which a consciousness comes to interpret certain peculiarities attaching to those items in its experiences which represent organisms and afterwards persons. The second stage is that whereby these peculiarities get carried back and attached to its own organism (*Selbst-einlegung*); and recognized

[1] *Kritik der Reinen Erfahrung*, and also *der Menschliche Weltbegriff*. The present writer judges the doctrines principally from the second-named work. The first is so obscurely written that one is tempted to confess a certain willingness to leave it unexplored.

as "subjective" (sensations, perceptions, thoughts), in both organisms, over against the regular "objective" elements contained in the rest of the world-experience.

This general doctrine of Avenarius finds profound justification, I think, from the genetic sphere, as the two phenomena "personality-suggestion" and "imitation" indicate. The first stage is what I have called the "projective" stage of the self-notion in what precedes. It is the stage in which the infant gets "personality-suggestions." It is simply the infant's way of getting "more copy" of a peculiar kind from its objective (personal) surroundings. The second stage is secured by imitation. The child reproduces the copy thus obtained, consisting of the physical signs and, through them, of their mental accompaniments. By this reproduction it "interprets" its projects as subjective in itself, and then refers them back to the "other person" again. Avenarius, as far as I have been able to discover, has no means of passing from the first to the second stage, from *project* to *subject*. He speaks[1] of a certain confusion (*Verwechselung*) of the projective experience (*T-Erfahrung*) with the remaining personal elements in consciousness (*M-Erfahrung*); but what the true leading-thread into this "confusion" and out of it is, he does not note. This is just what I claim the function of imitation does; it supplies the bridge with two reaches. It enables me to pass from my experience of what you are, to an interpretation of what I am; and then from this fuller sense of what I am, back to a fuller knowledge of what you are.[2]

[1] *Loc. cit.*, § 51, p. 30, and § 95, p. 49.

[2] In the use of the two facts, "personality-suggestion" and "imitation," my development is quite unindebted to Avenarius, who writes from the point of view of race history and criticism. I do not adopt the word

§ 24. The two principles, habit and accommodation, now get application on a higher plane: a plane which is the theatre of the rise of moral sentiment. Again disclaiming adequacy of treatment, I think some light falls on the growth of ethical feeling from the psychology of imitation. Moral sentiment arises evidently around acts and attitudes of will. It is accordingly to be expected that the account of the genesis of volition will throw some light upon the conditions of the rise of conscience. If it be true that present character is the deposit of all former reactions of whatever kind, and that what we call will is a general term for our concrete acts of volition; then according as these acts of volition are done in reference to suggestion from persons, or represent partial expressions of personal character, there arises a division within the notion of self. Your suggestion may conflict with my desire: my desire may conflict with present sympathy. Self meets self, so to speak. It is no longer a matter of simple habit *versus* simple suggestion as is the case in infancy, before the self becomes a voluntary agent. It is now

"introjection" since it covers too much; my word "project" signifies the child's sense of others' personality before it has a sense of its own. The rest proceeds by imitation. This distinction of method raises a further question which should be carefully discussed in all problems for which a genetic solution is sought, *i.e.*, how far the genetic process itself in the individual's growth has become a matter of race habit or instinct. That is, granted a process of origin correctly depicted, to what extent must we say that each new individual of the race passes through it in all its details? Does mental ontogenesis repeat mental phylogenesis? The origin of impulse and instinct illustrate the possible abbreviation of these processes and the starting of the individual from points of higher vantage. I am not prepared to say that an isolated child, for example, might not get a high self-notion (as he might learn to speak somehow) if deprived of all social suggestions; but it would not be the self-notion that he does get. *Cf.* the note on Professor Bain's arguments to prove that imitation is not instinctive, below, § 28.

that form of habit which is personal agency coming into conflict with that form of suggestion which is also personal to me as representing my social self. Your example is powerful to me intrinsically; not because it is abstractly good or evil, but because it represents a part of myself, inasmuch as I have become what I am in part through my sympathy with you and imitation of you.

When I come to a new moral situation, therefore, my state is this: I am in a condition of relative equilibrium, or balance of two factors — my personal or habitual self, and my larger social suggestible self. The new experience tends to destroy this equilibrium by reinforcing my "copy" on one side or the other, and so to lead me out for further habit or for new social adaptations.

And now on this basis comes a new mental movement which seems to me to involve a further development of the imitative *motif* — a development which substitutes warmth and life for the horrible coldness and death of that view which identifies voluntary morality with submission to a "word of command." The child, it is true, very soon comes across that most momentous thing in its moral environment which we call authority; and acquires that most significant thing in our moral equipment which we call obedience. He acquires obedience in one of two ways, or both: by suggestion or by punishment. The way of suggestion is the higher way, because it proceeds by gradual lessons in accommodation, until the habit of regularity in conduct is acquired in opposition to the capriciousness of his own reactions. It is also the better way because it sets before the child in an object lesson an example of that stability and lawfulness which it is the end of all obedience to foster. Yet punishment is good and often necessary. Punishment

is nature's way: she inflicts the punishment first, and afterwards nurses the insight by which the punishment comes to be understood. A child's capricious movement brings the pain which represents all the organic growth of the race; and so when we punish a child's capricious conduct, we are letting fall upon him the pain which represents all the social and ethical growth of the race. But by whatever method — suggestion or punishment — the object is the same: to preserve the child until he learns from his own habit the insight which is necessary to his own salvation through intelligent submission.

But whether obedience comes by suggestion or by punishment it has this genetic value: it leads to another refinement in the sense of self, at first "projective" then subjective. The child finds himself stimulated constantly to deny his impulses, his desires, even his irregular sympathies, by conforming to the will of another. This other represents a regular, systematic, unflinching, but reasonable personality — still a person, but a very different person from the child's own. Here is a copy which is a personal authority or law. It is "projective" because he cannot understand it, cannot anticipate it. And again it is only by imitation that he is to reproduce it, and so to arrive at a knowledge of what he is to understand it to be. So it is a copy. It is its aim — so might the child say, were he an adult — and should be mine — if I am awake to it — to have me obey it, act like it, think like it, be like it in all respects. It is not I, but I am to become it. Here is my ideal self, my final pattern, my "ought" set before me. Only in so far as I get into the habit of doing and being like it, get my character moulded into conformity with it, only so far am I good. And like all other imitative functions

it teaches its lesson only by stimulating to action. I must succeed in doing, if I would understand. But as I thus progress in doing, I for ever find new patterns set for me; and so my ethical insight must always find its profoundest expression in that yearning which anticipates but does not overtake the ideal.[1]

My sense of moral ideal, therefore, is my sense of a possible perfect, regular will in me in which the personal and the social self — my habits and my social calls — are completely in harmony: the sense of obligation in me is the sense of lack of such harmony — of the actual discrepancies in my various thoughts of self, as my actions and tendencies give rise to them. And the thought of this ideal self, made ejective, as out of and beyond me — this is embodied in the moral sanctions of society, and finally in God.[2]

The value of the ejective sense of moral self is seen in the great sensitiveness we have to the supposed opinions of others about our conduct. It is an ingredient of extraordinary influence. From the account given of the rise of the sense of obligation, we should expect the two very subtle aspects of this sensitiveness which are actually present. First, in general, our dread and fear before another's fancied opinion is in direct proportion to our own sense of self-condemnation. Consciousness is clear on this point. It must be so if it is true that our sense of self-condemnation is of social origin, *i. e.*, arises from our imitative response to the well-sanctioned

[1] *Cf.* the paper on "The Cosmic and the Moral," above.

[2] On the distinctively social function of imitation, Tarde and Sighele both dwell in the works named, the latter endeavoring to lay the foundations of a science of "collective psychology." See also, for the extended development of the theory of the origin of the moral consciousness, the writer's *Social and Eth. Interpretations* (with the new matter added in the third edition, 1902).

opinions and commands of others. But second, the intelligent observation of the opinions of others, and the suffering of the penalties of social law, react back constantly to purify and elevate the standards which one sets himself. There is, therefore, a constant progress, from the action and reaction of society upon the individual and the individual upon society.

§ 25. In a recent article, Professor Josiah Royce[1] distinguishes between the two earlier phases of self which I have pointed out, but does not develop the third. Yet he indicates clearly and with emphasis the twofold element of conflict under which the moral sense develops. The ordinary accounts on the natural history side, from Darwin[2] to the present, simply describe a conflict in consciousness between sympathy and selfishness. This fails to do justice to the "law" element in the genesis of morality. I should go farther than Royce does in emphasizing this element, believing as I do that there is no sense of oughtness until the child gets the basis laid of a *habit* which not only calls upon him to deny his private selfishness in favor of sympathy, but also his private sympathies in favor of reasonable regularity learned through submission. The opposition, between my regular personal ideal and all else — whether it be the regularity of my selfish habit or the irregularity of my generous responses — this is the essential condition of the rise of obligation. And it is in as far as this ought-feeling goes out beyond the copy-elements drawn from actual instances of action, and anticipates better or more ideal action, that the antithesis between the "ought" and the "is" has its psychological justification.

The question whether obedience is a case of imita-

[1] *International Journ. of Ethics*, July, 1893, p. 430.

[2] *Descent of Man*, part i. chap. iii.

tion[1] is largely a matter of definition. So far as the copy set in the "word of command" is reproduced, the reaction is imitative. A child cannot obey a command to do what he does not know how to do. The circumstances of his doing it, however, the forcible presentation of the copy by another person, this seems only to add additional elements to the copy itself. The child has in view, when he obeys, not only the thing he is to do, but the circumstances — the consequences, the punishment, the reward — and these also he seeks to reproduce or to avoid. On the other hand, it may well be asked whether all of our voluntary imitations, and actions generally, are not cases of obedience; for it is only when an idea gets certain force, and sanctions, and social setting, that it is influential in bringing us out for its reproduction. Of course this is only further play on definitions; but it serves to indicate the real elements in the situation. When Tönnies says that obedience comes first and imitation afterwards, he refers to voluntary imitation of a particular type. An infant does not obey a command until he has learned how to perform it; and that suffices, with its sanctions, to give him "copy" for imitation in a broader sense.

§ 26. It is possible, on the basis of the preceding development, to lay out a scheme of notions and terms to govern the discussion of the whole matter of imitation. This has been the "loose joint" in many discussions: the utter lack of any well-defined limits set to the phenomena in question. Tarde practically claims all cases of organic or social resemblance as instances of imitation, overlooking the truth, as one

[1] See discussion by Tarde, *loc. cit.*, and Paulhan, *Revue Philosophique*, Aug., 189, p. 1790: also Tönnies, *Philosophische Monatshefte*, 1893, p. 308.

of his critics takes pains to point out, that two things which resemble each other may be common effects of the same cause. Others are disposed to consider the voluntary imitation of an action as the only legitimate case of imitation. We have reason to think, however, that volition requires a finely complex system of copy-elements, whose presence can be accounted for only on the basis of earlier imitation reactions. Further, it is the lower, less volitional types of mind that imitation especially characterizes. If we then say that imitation always involves a presentation or image of the situation or object imitated — a position very near the popular use of the term — then we have great difficulty in accounting for those reactions which reproduce subconscious, vaguely present stimulations: for example, the acquisition of facial expression, the contagion of emotion, the growth of style in dress and institutions — what may be called the influence of the "psychic atmosphere."

I think we have found reason from the analysis above, to hold that our provisional definition of imitation is just: an imitative reaction is in its type one which repeats its own stimulus. This is what we find the nervous and muscular mechanism suited to, and this is what we find the organism doing in a progressive way in all the types of function which we have passed in review. If this is too broad a definition, then what I have traced must be given some other name, and imitation applied to any more restricted function that can be clearly and finally marked out.

Adhering then to the definition which makes of imitation an organic type, we may point out its various "kinds," according to the degree in which a reaction of the general type has, by complication, abbreviation, sub-

stitution, inhibition, departed in the development of consciousness from its typical simplicity. We find in fact three great instances of function, all of which conform to the imitative type.

First: simple contractility which reproduces its stimulus. This may be called *biological* imitation.[1] Under this head fall all cases lower down than the conscious picturing of copies: lower down in the sense of not involving, and never having involved, for their execution, a conscious sensory or intellectual stimulus, with the possibility of its revival as memory. On the nervous side, such reactions may be called *subcortical;* and in view of another class mentioned below, they may be further qualified as *primarily subcortical.*

These "biological" reactions are evidently first in order of development, and represent the gains or accommodations of the organism made independently of the conscious picturing of copies. They represent organic responses which are useful for repetition. They serve for the accumulation of material for conscious and voluntary actions. In the animals, the scope of such action is very limited, because of the complete instinctive equipment which young animals bring into the world; but in human infants it plays an important part as the means of the gradual reduction to order and utility of the random spontaneous movements. I have noted its presence under the phrase "pre-imitative" or "physiological" suggestion[2] in another place. It is under this head that the so-called

[1] Called "organic imitation" or "circular reaction" in *Mental Development;* the latter named term is the better.

[2] *Science,* xxvii., 1891, p. 113. Of course the phrase pre-imitative did not contemplate the broader use of the term imitation which I am now employing, but limited it to conscious imitation.

"selective" function of the nervous system finds its first illustration.[1]

Second: we pass to *psychological* or *cortical* imitations. The criterion of imitation — the copy for reproduction — is here preserved in the shape of conscious sensations and images. The copy becomes consciously available in two ways: first, as sensation, which the imitative reaction seeks to continue or reproduce (as the imitation of words heard, movements seen, etc.); and second, as memory. In this latter case there arises desire, in which there is consciousness of the imitative tendency as respects an agreeable memory-copy; and with the persistence of such a copy, and its partial repression by other elements of memory, comes volition. We find, accordingly, two kinds of psychological or cortical imitation, which I have called in the article already quoted[2] respectively "simple" and "persistent" imitation. Simple imitation is the sensory-motor or ideo-motor suggestion which reproduces its own stimulus; and persistent imitation is the "try-try-again" experience of early volition.

Third: a great class of facts which we may well

[1] This distinction between young children and the young of animals gives us the reason that we do not find clear imitations as common among the animals as we should expect — monkeys and parrots possibly excepted. In the words of Preyer (*Physiologie des Embryos*, p. 545), "the more kinds of co-ordinated movement an animal brings into the world, the fewer is he able to learn afterwards." The child is *par excellence* the animal that learns; and if imitation is the way to learn, he has "chosen the better part" in being more imitative than the rest. Animal imitativeness is generally understated, however — *cf.* the remarkable performances of dogs, cats, birds, etc., in the way of imitation in Romanes' *Evol. of Mind in Animals*, chap. xiv. The most social animals, including man, are the most imitative, as we should expect; since both sociability and imitation are connected with what we have called "personality-suggestion."

[2] "The Origin of Volition," above.

designate by the term *plastic* or *secondarily-subcortical* imitation, *i. e.*, all the cases of stimulus-repeating reaction which once represented conscious adaptation, but have become what is ordinarily called "secondary-automatic" and subconscious. These cases we have found readily explainable by the hypothesis of lapsed links in the memory copy system, or, put more shortly, by the principle of habit. So we find under this heading such fundamental facts for social psychology as the social phenomena of contagion, fashion, mob-law, which Tarde and Sighele so well emphasize, the imitation of facial and emotional expression, moral influence, organic sympathy, personal rapport, etc. The term plastic serves to point out the rather helpless condition of the person who imitates, and by so doing interprets in his own action the more intangible influences of his estate in life.[1]

§ 27. Before concluding, I wish to draw attention to certain more obscure instances of imitation, and assign them their place in the general scheme of development.

The social instances noticed at length by Tarde, and summarized under so-called "laws," are easily reduced to more general principles. Tarde enunciated a law based on the fact that people copy thoughts and opinions before they copy dress and customs: *i. e.*, "imitation proceeds from the internal to the external." As far as this is true it is only partially imitation. Thoughts and opinions are copied because they are most important; and as the copier thinks with another

[1] An extremely subtle and interesting phenomenon under this head is that usually described as the influence of example on personal belief. What we call persuasion is largely the suggestion of the emotion which accompanies strong conviction, with the corresponding influence which the emotion suggested has upon the logical relationships apprehended by the victim.

he acts with him, since like thought produces like conduct. But in fact is there such a general truth? American ladies take their styles in dress from the French, but they do not defer to the sentiments of French social circles; they rather imitate in literature and higher things the opinions of the English, whose dress they consider inferior. Further, a child imitates persons, and what he copies most largely are the personal points of evidence, so to speak; the boldest, most external manifestations, not the inner essential mental things. It is only as he grows to make a conscious distinction between thought and action that he gives the former a higher valuation.

Again, Tarde's laws relative to *imitation mode* and *imitation coutume* — the former having in its eye the new, fashionable, and popular, the fad; the latter, the old, venerable, and customary — are so clearly partial statements of the principles of accommodation and habit, as they get application on a broader social scale, that it is not necessary to dwell further upon them.[1]

The phenomena of hypnotism illustrate most strikingly the reality of imitation at a certain stage of mental life. Delbœuf makes it probable[2] that the characteristic peculiarities of the "stages" of the Paris school are due to this influence; and the wider question may well be opened whether suggestion generally, as understood in hypnotic work, might not be better expressed by some formula which recognizes the fundamental sameness of all reactions — normal, pathological, hypnotic, degenerative — which exhibit the form of stimulus-repeating or "circular" process characteristic of simple imitation. In

[1] Tarde's other principle that "inferiors imitate superiors" is clearly a corollary from the view that the progressive ideal personality arises through social suggestion.

[2] *Revue Philosophique*, xxii. pp. 146 ff.

normal, personal, and social suggestion the copy elements are in part unrecognized, and their reactions are subject to inhibition and blocking-off by the various voluntary and complicated tendencies which have the floor. In sleep, the copy elements are largely spontaneous images thrown up by the play of association or stimulated by outside trivialities, and all so weak that while action follows in the dream-persons, it does not follow in the dreamer's own muscles. In hypnotic somnambulism all copy elements are from the outside, thrown in; the inner fountains are blocked; action follows upon idea, whatever it is. Even the idea of no action is acted out by the lethargic, and the idea of fixed action by the cataleptic.[1] And all the vagaries of Luys himself get "demonstrated" with reality enough, because Luys sets the "copy." Further, in certain cases of madness (*folie à deux*, etc.) the afflicted patient acts out responses to a certain personal copy which has become fixed in the progress of the disease, and perhaps has aided in its production.[2] In all these cases, the peculiar character of which is the performance, under conditions commonly called those of aboulia,[3] of reactions which require the muscular co-ordinations usually employed by voluntary action, we have illustrations of "plastic"

[1] It may be well to quote Janet's summary of his determinations of the characteristic features of general catalepsy, all of which indicate a purely imitative condition of consciousness, *Aut. Psych.*, p. 55: "The different phenomena which we have described are these, *i. e.*, the continuation of an attitude or a movement, the repetition of movements which have been seen and of sounds which have been heard, the harmonious association of the members and of their movements."

[2] *Cf.* Falret, *Études cliniques sur les maladies mentales et nerveuses*, p. 547.

[3] This would involve a doctrine which holds that in the hypnotic state, there is inhibition of the cortical associative or synthetic function, but not of the simple cortical sense function: *cf.* Gurney's remarks on Heidenhain's explanation of "hypnotic mimicry" in *Mind*, 1884, p. 493.

imitation. On the pathological side, we find, in aphasic patients who cannot write or speak spontaneously, but who still can copy handwriting and speak after another, cases which illustrate the same kind of defect yet in which the defect is not general, but rather confined to a particular group of reactions by reason of a circumscribed lesion.

§ 28. An examination of Professor Bain's forceful arguments against the view that imitation is an "instinct"[1] will suffice, finally, to set out clearly the *via media* which the conception of this paper suggests.[2] Bain's definition of imitation assigns it a place (the fourth stage) among the acquired reactions which contribute to the development of volition. Imitation is always voluntary, *i. e.*, a conscious repetition of a pictured copy due to association.[3] The argument first advanced to disprove instinctive imitation is this: if imitation were an instinct it would appear earlier in infant life than it does (second half-year).[4] This fact, however,

[1] Using instinct in the sense of what is native — not acquired. "Impulsive" is better than "instinctive" throughout.

[2] Bain, *Senses and Intellect*, pp. 413 ff. (3rd ed.). Professor Bain has somewhat modified his view in his later (4th) edition.

[3] *Ibid.*, pp. 411 and 413, also 417.

[4] Professor Sully, *The Human Mind*, ii. 218, also makes this point. Sully makes the following statements in three successive paragraphs; I am quite unable to reconcile them except by modifying them all into conformity with a deeper-going theory of the imitative reaction. (I have ventured to insert in the square brackets after each of these quotations the paragraphs in this paper which bear on it — supposing my general definition of imitation to be correct). He says (*loc. cit.*, 218): "Since it only begins to appear about the fourth month, when simple *voluntary* action directed towards an end is also first recognizable, it is possible that imitation is acquired" [§ 28]: then (219), "As a rapid reaction of a sensori-motor form, it has the look of a mechanical process . . . in many cases there seems to be no conscious purpose. . . . There is much to favor the view that it is purely ideo-motor and so subvolitional" [§§ 11–13 and 26]: then (219 note), "It is pointed out by Gurney that imitation plays a conspic-

may be accounted for on grounds which still leave a balance of inherited organic ("biological" and so instinctive) imitations. The child's early months are taken up with its vegetative functions. Further, accidental imitations struck by him cannot give pleasure until the senses are sharpened to discern them, and until the attention is capable of its operations of comparison, co-ordination, etc.; before this there is no element of pleasure to lend its influence for the continuance of an imitation. As soon as these conditions get fulfilled, we find not only that the child begins to show germinal imitations, such as the monotonous repetition of its own vocal performances (ma-ma-ma-), but also that its nervous connections give it an instinctive tendency to biological subconscious reactions, distinctly of the imitative type, *i. e.*, the walking alternation of the legs. In the main, therefore, there is instinctive tendency to functions of the imitative type and to some few organic imitations; but those clear conscious imitations which represent new accommodations and acquirements (and it is these which Bain, by definition, has in view) are not instinctive. Infants show remarkable differences in the readiness and facility with which they learn to speak. This does not arise from difference in practice, for practice never overcomes the difference; but it is due to differences in the native tendencies of the in-

uous part in the hypnotic state" [§ 27]: and again (219–220), "Imitation follows on the persistence of motor-ideas *having a pleasurable interest*. . . . The child does not imitate *all* the actions it sees, but only certain ones which specially impress it. . . . Hence in most, at least, of a child's imitation there is a rudiment of desire. For the rest, the abundant imitative activity of early life illustrates the strength of the *playful* impulse, of the disposition to indulge in motor activity for the sake of its intrinsic pleasurableness" (italics his) [§§ 22 and 28]. Again (109), he makes imitative sympathy instinctive [§§ 19 and 26].

fants to a reaction which is, *par excellence*, imitative in its type and method of development."[1]

On this basis it is possible to admit the truth of the remaining points of Bain's text,[2] at the same time that we recognize a great class of quite involuntary sensori-motor and ideo-motor, as purely biological reactions which fall under the imitative type, and which represent instinctive inherited tendencies to movement. In more undeveloped consciousness, further, we find that the purely suggestive influence of a "copy" for imitation may be so strong that reactions follow despite their painful character: a fact which would be impossible on the theory that all voluntary action is acquired under lead of the pleasure-pain association. The law of habit, which exhibits itself in the inherited motor tendencies I have spoken of, is in these cases too strong for the law of accommodation through pleasure-pain, and works itself out in conduct in opposition to warnings of temporary damage to the organism.

§ 29. The place of imitation has now been made out in a tentative way throughout the development of the active life. It seems to be everywhere. But it is, of course, a matter of natural history that this type of action is of such extraordinary and unlooked-for importance. If we grant evolution of mind, circular reaction of the imitative type may be considered one of the principal laws of the progressive interaction of the organism and its environment. The further philosophical questions as to the nature of mind, its worth and its dignity, of course remain over. We have learned too much in modern philosophy to argue from

[1] The same may be said of handwriting. *Cf.* Romanes, *Ment. Ev. in An.*, p. 194.

[2] Points which I have also contended for as illustrating the painstaking and tentative stages in the development of voluntary movement through imitation.

the natural history of a thing to its ultimate constitution and meaning. So far as there is a more general lesson to be learned from the considerations advanced, it is that we should avoid just this danger, *i. e.*, of interpreting one kind of existence for itself, in an isolated way, without due regard to other kinds of existence with which its manifestations are mixed up. The antithesis, for example, between the self and the world is not a valid antithesis psychologically considered. The self is realized by taking in "copies" from the world, and the world is enabled to set higher copies only through the constant reactions of the individual self upon it. Morally I am as much a part of society as physically I am a part of the world's fauna; and as my body gets its best explanation from the point of view of its place in a zoölogical scale, so morally I occupy a place in the social order; and an important factor in the understanding of me is the understanding of it.

The philosophical question is — when put in the phraseology of imitation — What is the final World-copy, and how did it come to be set?[1]

[1] It will be remarked that this whole paper deals with what may be called "representative copies" as opposed to "constructive copies," that is, it avoids the question of invention *versus* imitation, except in so far as to hold (§§ 15, 18), that the material of mental construction is always representative, part of the memory copy system. The further question of how this material can get shaped into new forms of invention, artistic arrangement, constructive thought, through imitation — this question remains over. It is not generally seen, however, that this question, as referring to consciousness, is one with the broader question of natural history *versus* special creation everywhere. Put broadly: how is it possible for anything to arise in Nature which is absolutely new to Nature in its function, yet fitted to utilize Nature and to survive in it? I have indicated elsewhere ("The Origin of Volition," above) the possible application of the natural history conception to one of these difficult problems, that of voluntary movement. (The general topic of "Invention" is taken up for detailed treatment in *Social and Ethical Interpretations.*)

# X

## THE ORIGIN OF EMOTIONAL EXPRESSION[1]

RECENT discussion has brought out certain great facts about the psycho-physics of emotion. The service of the "peripheral" theory as announced by Lange and James, and especially as argued by the latter, has been to set this problem in evidence. Undoubtedly the stimulating and highly valuable influence of James' treatment — here as on many other points — has been due to a certain frankness and *naïve* clearness which has concealed in a measure the real complexity of the problem.

The outcome of a discussion in which this "peripheral" theory has had able but, I think, very inadequate criticism takes form about two or three general principles which it may be well to state in their general bearing upon the origin of emotional expression. It has been evident from the first that the "emotion" that the peripheralists are talking about is a phenomenon of endowment — something that a baby already has; and that the emotion that the adversaries of the theory are talking about is a phenomenon of ideas — something that the baby has yet to get. If this be true — and no one denies the distinction in fact, apart from the terms which have hopelessly obscured it — it becomes just as evident that the question as to what the components of emotion are is really a genetic question. All the ele-

[1] From the *Psychological Review*, I., 1894, p. 610.

ments of the problem of the genesis of reactions — that of the laws of motor development — must be recognized and woven into an adequate theory. This is what I mean by saying that the "effect" theory of emotion is *naïve* — just as much so as is the older "cause" theory.

When, then, we come to take a broad survey of motor development, in the race no less than in the child, we are able to signalize certain great principles which we must recognize: principles which stand out in biology and in psychology as essential to the theory of genesis. The range of facts fairly shown by recent discussion to be available for the genetic theory of emotion-reactions may be stated under three such principles. These are *Habit*, used broadly to include the effects of repetition and hereditary accumulation (whatever theory of the latter we may adopt); *Accommodation*, the law of individual adaptation in all evolution, no matter how adaptation is secured; and, earliest and most fundamental, *Dynamogenesis*, expressing the fact simply of regular connection between the sensory and motor functions of all living organisms, as to amount of process.

I. As for the fact of dynamogenesis: who doubts its force? I have been so sure of it that I have made it the ever-present fact in the whole analysis of the "motor consciousness."[1] Fouillée writes an entire treatise to expound it.[2] And as for the advocates of the theory of emotion now in question, no one has done more to prove this truth of dynamogenesis than Féré,[3] and no one more to illustrate it than James.[4]

But what bearing has this principle upon the theory of emotion? Much every way. We must bear in mind that this principle has always operated, and is always

[1] See my *Feeling and Will*, Part IV.
[2] *Psychologie des Idées-Forces.*
[3] *Recherches sur la Sensibilité.*
[4] *Principles of Psychology.*

operating, in every reaction we make; that our reactions have grown to be what they are in all cases by direct reflection of what we have received or experienced; that just as certain as it is that we are experiencing new things every instant of our lives, just so certain is it that we are expressing these new experiences through the actions that we perform. Every one is familiar with Professor James' view that we never have the same idea or content twice. Of course we do not. But the correlative fact has not had recognition. As we never experience the same twice, so we never *act* the same twice. The new $x$ of content, added to the old $c$ of content, must call out a new $y$ of action, added to the old $a$ of action. If then our new reaction is always $a + y$, just as the content which it follows upon is $c + x$, then no reaction is ever that and that only which is guaranteed by habit, or inheritance, or what not, from the past. So it cannot be that emotion is nothing but the "effect" in consciousness of such processes of habit.

It is easy to see, however, that the "effect" advocate has a way of escape from any such easy trap. He admits it all, and adds a pertinent view. He distinguishes content + its expression from content + *feeling* of its expression; saying that there is no consciousness or feeling of the new element, $y$, of motor process until it is itself reported as a new element of sensory content. Quite possible; it may be so — if the nervous system has developed that way. But the question whether it has developed that way resolves itself into the more theoretical one, how could it develop that way? That is, assuming that it has, what view must we then hold as to the actual mode which the organism has of acquiring reactions to new elements of content; or, in short, of acquiring any new reactions? This clearly takes us

into the domain of another of the principles of development mentioned above, Accommodation. But before we turn to that, certain deductions favorable to the theory in question may be shown by what precedes to be necessary from the third of our principles, Habit.

II. It is now evident that the stimulation to a motor reaction of any kind has always two factors: one the discharges fixed by habit, and the other those aroused by the new elements of content presented by the environment. But we know that habit tends to make reactions automatic and reflex; and that consciousness tends to evaporate from such reactions. As I put it formerly, "psychologically, it [habit] means loss of oversight, diffusion of attention, subsiding consciousness."[1] Hence we must admit that the reactions most dominated by habit — the smoothest, best inherited, most instinctive reactions — have *least consciousness*. And, on the other hand, where habit is least influential, where the content is largely new, where the pleasure or pain of its assimilation is great, where attention and effort are strained, where excitement runs high — in all these cases the stimulating influence is new, one which has not yet been brought under the influence of habit, and so one which adds new dynamogenic processes to the reaction.

It turns out, however, that just those "expressive" reactions which are most instinctive and reflex (fear, anger, joy, etc.) really do carry with them most of the consciousness which we call emotion — certainly vivid and disturbed enough. What then shall we say? Either that there are other new elements of content additional to the regular antecedents of the reflex; or that the emotion is not the antecedent of the expression at all, but that the reverse is true — the emotion is con-

[1] *Feeling and Will*, p. 49.

sequent upon the expression. We cannot hold to the former alternative. Where are the adequate stimulants in conscious content to the newly-hatched chick's reactions of fear? So we must take the other alternative, and *hand over all this class of reactions to the effect theory*, admitting that the emotion, as far as it has fixed instinctive forms of expression, follows upon the expression. I have no hesitation, therefore, in adopting the "effect" theory of Lange and James as regards inherited emotional expression excited by constant definite objects of presentation — so far as the force of this argument goes.

This case presents, therefore, no exception to the law of expression, *i. e.*, the law that that which is habitual is accompanied by least consciousness. The high consciousness is a reflex effect. But we should expect, on the other hand, that in all the ideal states of mind, in all the new complications of content to which the attention has to be adjusted, in all emotional states which do not attach immediately and unreflectively to conscious objects of presentation, — that in all these cases the exciting processes should arouse elements of expression over and above the reactions due to habit. This is really the outcome — and I think about the only outcome — of the numerous criticisms of James recently made from different points of view.

But it should be remembered that a claim is still open to the "effect" theorist, as was said above; namely, that even though this be true, still the central process at the base of it may not itself come into consciousness as emotion. It may come into consciousness only as presentation, attention, etc., the emotion-consciousness not arising until the reaction thus stimulated is *reported back* from the periphery. But, again, this whole question of the

behavior of the organism in the presence of the intellectually new as opposed to the habitual is only another stage of the question spoken of above; *i. e.*, the behavior of the organism in the presence of new sense-stimulations. How has the organism been able to acquire new reactions *of any kind?* — a genetic question and a fundamental one. This leads again to the principle of Accommodation, to which I now turn.

III. The principle of "accommodation" — the individual phase of the biological problem of adaptation in evolution — is the most urgent, difficult, and neglected question of the new genetic psychology. How can consciousness ever, under any circumstances, get a new and better-adapted function? In answer to this question there has been only one theory in the field, that of Bain, in the latest formulation of which he shows its conformity to evolution requirements. Spencer's theory is purely biological and seems to be open to some of the modifications (and more) suggested by Bain in the following passage,[1] which is his latest utterance, I think:

"My leading postulates — Spontaneity, the continuing of an action that gives pleasure, and the contiguous growth of an accidental connection — are all involved in Mr. Spencer's explanation of the development of our activity. . . . The spontaneous commencement is expressed by him as a diffused discharge of muscular energy (*Psychology*, Vol. I. p. 544). He considers that as nervous structures become more complicated, every special muscular excitement is accompanied by some general muscular excitement. Along with the concentrated discharge to particular muscles, the ganglionic plexuses inevitably carry off a certain diffused discharge to the muscles at large; and this diffused

[1] *Emotions and Will*, 3d ed. 1888, pp. 318 f. The passage is substantially the same in the 4th ed.

discharge may lead to the happy movement suitable to some emergency.

"This is the doctrine of Spontaneity in a very contracted shape; too contracted in my judgment for the requirements of the case. I have adverted to the inferiority of the diffused wave accompanying a central process, whether active or emotional, such as is here assumed. If another source of chance muscular movements can be assigned, and if that source presents advantages over the diffused discharge, we ought to include it in our hypothesis. . . . Mr. Darwin expresses what is tantamount to the spontaneity of movement thus: 'When the sensorium is strongly excited, the muscles of the body are generally thrown into violent action.' 'Involuntary and purposeless contractions of the muscles of the chest and glottis, excited in the above manner, may have first given rise to the emission of vocal sounds" (*Expression,* pp. 82, 83). This is spontaneous commencement under circumstances of strong excitement; but I have endeavored to show that excitement is unnecessary, and that spontaneity is a fact of the ordinary working of the organs.

"The second indispensable requisite to voluntary acquisition, as well as to the consolidation of instinctive powers, is some force that clenches and confirms some successful chance coincidence. Mr. Spencer's view of this operation is given thus: 'After success will immediately come pleasurable sensations with an accompanying large draught of nervous energy towards the organs employed.' 'The lines of communication through which the diffused discharge happened in this case to pass have opened a new way to certain wide channels of escape; and consequently they have suddenly become lines through which a larger quantity of molecular motion is drawn, and lines which are so rendered more permeable than before.'

"Here is assumed the Law of Pleasure and Pain. Pleasure is accompanied by heightened nervous energy, which

nervous energy finds its way to the lines of communication that have been opened up by the lucky coincidence. There is assumed as a consequence the third of the above postulates — the contiguous adhesion between the two states, the state of feeling and the appropriate muscular state. The physical expression given by Mr. Spencer to this result is, I have no doubt, correct — 'the opening up of lines of discharge that draw off large amounts of molecular motion.'"

Bain's three postulates touch the inevitable requirements of a theory, *i. e.*, first, to get movements (his "spontaneity" as a substitute for Spencer's "diffused discharge" and Darwin's "purposeless contractions"); second, to get selections made from these movements (his "accidental success" of certain movements); and third, "some force that clenches and confirms some successful chance coincidence" ("pleasure and pain," identified with Spencer's "heightened nervous energy which finds its way to the lines of communication that have been opened up by the lucky coincidence").

I do not intend to go into a criticism of this scheme in detail, especially as I intend soon to publish a book containing a detailed theory of accommodation.[1] But it is evident that the truth — if it be true — of "spontaneity" in developed organisms does not invalidate or even supersede Spencer's "diffused discharge"; for the phylogenetic explanation of spontaneity — the question how did spontaneity arise — must rest on some such hypothesis as Spencer's. But the question comes: given movements — by either of these principles, both, or neither — how are some of them selected and preserved?

[1] *Ment. Development in the Child and the Race*, 1st ed. 1895. A sketch of some of its features may be read in the paper on *Imitation* preceding this.

Here again the answer comes from both authors: the fitness of those selected, by the operation of some sort of selection to movements overproduced in quantity. This we may admit as most likely. But now — and here we reach our topic again, emotion — how are these successful, good, advantageous movements kept up? "Pleasure and pain" is at once on everybody's lips, Bain's, Spencer's, *et al.* But how? Evidently by association, we are told. The lucky movement gives pleasure; it is done again to secure the pleasure again. But we may say: for an association one term must be given; either the pleasure to bring up the movement, or the movement to bring up the pleasure. We must have the presence of the one in some kind of "organic memory" in order to get the presence of the other. How does the organism get started toward either? Here Mr. Spencer's theory, on the organic side, gives us an answer; and Bain, as it seems to me, adopts it as a supplement, in the quotation made above from his third edition, directly from Spencer. "Here is assumed," says Bain, "the 'law of pleasure and pain' [whereby] pleasure is accompanied by *heightened nervous energy*, which nervous energy finds its way to the lines of communication that have been opened up by the lucky coincidence." This leads to the repetition of the pleasure-going action in what I call a "circular" way.

Let us say, then, that something equivalent to "heightened nervous energy" alone can explain the repetition of useful and pleasurable reactions. After sufficient criticism and definition — which are now reserved — we may call this for convenience the principle of "Excess Discharge," and say that pleasure and pain can be agents of accommodation and development only if the one, pleasure, carry with it the phenomenon of

"excess discharge," and the other, pain, the reverse — probably some form of inhibition or of antagonistic contraction. On this basis Darwin's well-known "laws" of the origin of emotional expression have their application.[1]

What has this to do with emotion? Again, much every way. The heightened nervous energy may not be — without further argument now out of place — assumed to be the "excitement of emotion"; and we may be dealing only with the pleasure-pain process: but even so, our analogy is worth something. Let us ask this question: where in the entire series of events — stimulus, central process, reaction — has the pain come in, before or after the first adapted movement, — the pain, that is, which has an inhibiting influence on this movement? The whole phraseology of Spencer and Bain would serve to make us think that it came in *after the movement only*, as part of the effect of the movement, so that, by the memory of the pain thus got, the movement is inhibited. The pain arising from the movement serves in memory to warn us *not to repeat the movement*.[2] But here I take issue blankly, contending that it comes in *by and with the stimulus* and *before* its discharge in movement, warning us not to move *so as to repeat that stimulus*. It is by this effect that the first adaptive movement is secured.

Let us take for scrutiny the customary illustration — the one which James uses in explaining the "Meynert scheme" of nervous action. A child thrusts his finger in a candle-flame, and is burned: he thrusts no more, but shrinks. Here the doctrine of Spencer, Bain, and many

[1] *Cf.* two articles by Professor Dewey in *The Psychological Review*, Nov. 1894, and Jan. 1895.

[2] In support of this construction, see Spencer, *Prin. of Psych.* vol. i., §§ 227 f., §§ 232, 237. Bain's view is given in the quotation made above.

others, seems to make the function of the pain the inhibition of the thrusting movement, as itself undesirable. But surely the case is very different. The inhibiting effect and the pain are brought about by the burn, and the recurrence of *that* — that is the thing to be prevented. The thrusting movement is a mere incident. Suppose the candle is brought up against the child instead of the reverse: it then shrinks from it just the same. The movement of the former case is inhibited, to be sure; but only because that is the way the developed organism *has learned to escape damaging stimulations in general.* But how it got this way of escaping them, that I contend is just what we are trying to explain — the fact of habitual expression. The real question is: how did the organism learn to withdraw? And the answer must be: the pain must have originally preceded the adaptive movement — as a signal of an injury. And this original differential motor effect of stimulations can only have been acquired by some form of selection.

We cannot simply leave the organism to the risks of getting repetitions of stimulus by accident; for that means that the organism waits the second time for the lucky chance, just as it did the first time: and that is to say that the pleasure of the first experience left no effect which by its mere presence could *increase the chance of good luck.*

So it follows that, as we had to hand over to the "effect" theory all the instinctive expressions, as being so reflex that there is no consciousness of them until their organic resonance is borne back to the centres, so now we see that *in its origin* each and every one of them was directly expressive of a state of consciousness, under the law of accommodation by pleasure and pain. These expressions have grown up, by such principles as Dar-

win's, as accretions to habit; but only because they at first followed definite pleasure-pain processes, and were each and all at first accommodations.

This principle applies also to all the organic, visceral, cœnæsthetic sensations so vital to many emotions. For we are of course driven to ask how it comes that habitual reactions, by becoming more reflex and hence less conscious, come to give, nevertheless, by their return wave upon consciousness, such overpowering floods of organic feeling. I think it is due to the fact that it was by muscular movement that such violent often long-continued protective or offensive reactions were carried out. This exhaustive muscular process taxed for its maintenance all the organic processes — heart, lungs, etc., — so that a great mass of organic sensations were thrown into consciousness, and by unbroken association have come to stand themselves, in union with muscular sensations, for the damaging or beneficial *kinds of stimulation* which at first excited pleasure or pain. And so far as they were themselves exhausting and devitalizing, they were directly painful. It is common doctrine that in our more violent organic reactions in emotion, the organism is recapitulating in amount the wear and tear of the long process of offence or defence that animal forms were accustomed to go through when they met the objects which now excite these emotions and sensations in us.

My charge therefore is this: the "effect" theory cannot be true from the point of view of the evolution or phylogeny of the pleasure-pain consciousness. And the argument is this: If (1) our theory makes use of pleasure and pain as an agent of development, it must make this pleasure and pain in the beginning antecedent to the reactions which stand for the adaptations secured by the pleasure and pain. The Spencer-Bain theory

makes memories of pleasure or pain antecedent to the repetition or inhibition of movements, but it recognizes no pleasure or pain *quâ stimulus* to the original adaptive movements; accordingly we have a dualism in the account of development, *i. e.*, pleasure-pain securing adaptations, and pleasure-pain emotions resulting from adaptations. No doubt both of these *are true as facts in developed organisms:* but we are now talking about *origins*. One of them must be original.[1] As I have said before succinctly: "The analogies from sensuous feeling [sense-pleasures] are all in favor of the central origin of emotion [idea-pleasures]. No one holds that sensations are felt only as far as they have motor expression. The kinæsthetic theory accordingly forfeits unity in its account of [the development of] sensibility."[2] If (2) the effect theory does not make use of pleasure and pain as agents of development, then it owes us a theory of development both of sensibility and of motor acquisition, for it throws away the Spencer-Bain theory. Such a theory would have to rest, so far as I see, upon "lucky" chance alone, going back to Bain's early view — before he supplemented it with Spencer's "diffused nervous discharge" — and developing all movement, voluntary as well as reflex, by simple chance repetition with association. Yet this, as I have urged above, makes an illicit use of the principle of association.

But this last is the view advocated by biologists; even those who, as in a recent case,[3] appeal to psychology

[1] See the reference to Marshall's "dualism" below. James attempts to bring the sense-pleasures and pains under his theory, in a recent discussion (*cf.* the "postscript" to this paper).

[2] *Feeling and Will*, p. 256. *Cf.* the detailed criticism of James by Worcester, in *Monist*, Jan., 1893, p. 285.

[3] Orr, *Theory of Heredity and Development*, pp. 95–101, who bases his theory of development upon the psychological principles "repetition" and

for analogies of development. I have before admitted the possibility of such a theoretical view, as regards some slight organic development; but I think with Spencer, Bain, and others, that it fails to account for any very complex motor acquisitions. It emasculates higher psychological theory by throwing over the teleological function of pleasure and pain — just the one thing which comes into clear consciousness in this matter of development. On such points I think psychologists may give some wholesome instruction to the biologists.

The place of sense-pleasures and pains, therefore, in my genetic theory, throws light at once upon the theory of emotional expression. Such pleasures and pains are not only indices of organic weal or woe; they are also dynamogenic agents of accommodation, by a direct influence upon muscular movement.[1] And the very same considerations apply also to ideal pleasures and pains, those, *e. g.*, which cluster about phases of attention, ideation, and object-consciousness generally. Intellect could not have developed in the first place, nor have become the magnificent engine of organic accommodation, through volition, which it is, if intellectual, æsthetic, and ethical pleasures were only the resonance of instinct-reflexes. Yet even here many of the qualitative marks, the excitement, the main psychosis apart from the pleasures and pains of new apprehensions, knowledges, curiosities, are just as surely, and for the same genetic reasons, the resonance of instinct-reflexes as are the gross fixed expressions of anger, fear, etc., in animals.

"association," and takes no note of the value of pleasure and pain, or their nervous equivalent, in the process.

[1] I have elsewhere insisted (*Feeling and Will*, chaps. v. and xi.) that the traditional "welfare" theory of pleasure and pain must be modified to apply to "prospective" experience; pleasure and pain must be agents of accommodation, if they are to be available in organic development.

The immediate locus of the hedonic element in most highly-toned psychoses is therefore sensory and central (*i. e.*, not a matter of reaction or "resonance"), and can only be "kinæsthetic" and motor in two cases: first when by endowment or habit the reaction has become reflex and the emotional storm bursts into consciousness with its organic associations by a return wave or "back stroke" (Ll. Morgan); or when the original pleasure or pain was itself an index of a muscular or other motor condition or function.

And we may go a step further and point out that even when the pleasure-pain element is thus reflex, an element in some sort of utility-reaction established by habit, it then nevertheless still plays the original rôle also, *i. e.*, it becomes the index of the relative advantage to the organism of that same utility-reaction in the newer conditions of life, and so tends to secure yet another secondary reaction. In this way while the pleasure-pain process may by constant association come to be part of a sensation or a whole sensation with a nerve-apparatus of its own, it then also serves, as all other sensations do, to start its own motor expression in some such antithesis of out-and-in movements as that suggested independently and on different grounds by Münsterberg and by myself. This latter reaction is then "toned" centrally, as the original utility-reaction was, and contributes a new hedonic element to consciousness. We thus have a certain genetic justification for the distinction between the "agreeableness" and "disagreeableness" of the higher life on the one hand, and the pleasure and "pain" of sensation on the other.[1]

Genetic conditions therefore — to sum up — require

[1] This point receives fuller notice in its proper theoretical position in the work *Mental Development*.

that there should be three elements in all emotion: (1) an habitual and in the main inborn element, due to a "return wave" from various instinctive expressions; (2) a present "accommodation" element of pleasure and pain produced in consciousness by new sensory, intellectual, and ideal processes; and (3) a "return wave" element from (2) and from muscular and organic processes in vital connection or association with (1) and (2).

The peripheral or "effect" theory recognizes the presence of (1), and (3); it does not account for the origin of (1), nor does it recognize (2).

The necessity for some such genetic reconstruction of the doctrine of emotion — to straighten out the tangled lines of fact — may be seen by the examination of a recent book in which many of the salient facts are stated with commendable clearness, but which in my view yet fails signally to unite them.[1] Mr. Marshall, by dubbing emotions instinct-feelings, goes so far — as James had also — to do justice to the fact of Habit in fixing emotional expression; but then he goes on to deny the adequacy of the effect theory of these instinct-feelings. He seems to suppose that there is a mental accompaniment of marked quality attaching to every instinct apart from its return wave of expression. But a genetic view of Habit would have saved him this; for everybody admits that the greater the fixity of habit the less the consciousness, and instinct is usually quoted as the best instance of this very truth.

But Mr. Marshall excepts from the definition of emotion, purely on genetic grounds, two great classes of reactions which nevertheless have emotional accompani-

[1] Marshall, *Pleasure, Pain, and Æsthetics.*

ments, *i. e.*, imitative reactions, and what I may, with his approval, call "self-exhibiting" reactions. These are not adequately fixed in instinct combinations, because their range of content and adaptation is too great to allow them to be shut down to definite channels. True again, and good, although I by no means accept this classification of such reactions. But as facts they illustrate the great genetic principle of accommodation; and if Mr. Marshall could bring himself to take a more genetic view, he would see that all the reactions which are now instincts were once in exactly the same state, but have become consolidated in definite ways upon definite objects. It would then be clear that all emotion is, *in its origin* and process of making, largely a central phenomenon of pleasure and pain, but that all emotion *in its development* is becoming a peripheral and organic phenomenon of "resonance" or reaction, according as, by the law of Habit, consciousness falls away from the business of the centres and attaches more and more to the business of the periphery.

So Mr. Marshall is then driven to a dualistic view of the affective life in its totality. He agrees with every one in making "pleasure-pain" and emotion both, as it were, thermometers (or why not *algedometers?*[1]) of development, the indications in consciousness of some sort of good or ill fortune. But he is forced to find them to be different thermometers for registering the same scale of temperatures — to carry out an inadequate figure. He himself has brought the same objection to the "well-being" theory of pleasure as against pain, *i. e.*, they should give two lines of development;[2] and then

[1] After analogy with Mr. Marshall's term "algedonics" suggested for the theory of pleasure and pain.

[2] A criticism which is wide of the mark, since all the evidence goes to

commits the analogous genetic error as respects pleasure-pain in contrast with emotion. He says (p. 93 f.): "The two sets of phenomena are allied in that both are primitive; in both cases we are able to trace their genesis back to the earliest developments of consciousness; both guide towards the advantageous and away from the disadvantageous."

In arguing this dualism by an analysis of the developed emotional consciousness, Mr. Marshall makes out his case again, I think, and adds one or two new and important *aperçus*, such as the difference between pleasure-pain-reactions and emotion-reactions, and such as the claim that pain expression can be inhibited without inhibiting the pain, while the same is not true of emotion. But when he says that "in both cases we are able to trace their genesis back to the earliest developments of consciousness," it only remains to ask; why not do it then? That is just the task which thoroughgoing genetic undertakes, and which Mr. Marshall dismisses in such words as these (p. 85): "The value of such argument, doubtful . . . even as far as we have gone, becomes more so the farther we proceed, because of the uncertainty as to the history of our racial development."

This dualism would require not only some such hypothesis as Spencer's "heightened nervous energy," to represent Bain's pleasure-pain factor, but also another kind of heightened nervous energy — for what else could it be? — to represent emotion. Is it not evidently better to say that one sort of heightened nervous energy does for both, and that the conscious difference

show that pleasure and pain represent complementary organic processes. Meynert's reaching and withdrawing, etc.; the plus and minus parts of the scale of the thermometer.

is due to the different sensory elements which come in together with the pleasure-pain? In sense-states we have pleasure-pain — *Gefühlston* — plus sense-quality (visual, auditory, etc.); in emotion-states we have pleasure-pain — *Vorstellungston* — plus sense-quality (muscular, organic, etc.). The difference, then, is one of developmental level. This seems to me to be fully covered by my hypothesis stated above that pleasure-pain represents the new accommodations, both at the beginning and at every stage of development, and that emotional expression represents the habits organized on the basis of the perception and recognition of objects. The possible dualism then is that between pleasure-pain and sensation.

*Postscript.* — Professor James' remarkable clearing-up article on "The Physical Basis of Emotion" in *The Psychological Review*, Sept., 1894, calls for an additional word of comment. This paper of his practically settles the controversy over his theory, I think. It shows that we have all misunderstood his book and also, I may venture to say that he is to blame for the misunderstanding. In my opinion, he now states a theory so different from that in his book that it is fair to add either that criticism has driven him out of his old position, or that what he has himself called "slap-dash" treatment — I call it above (written before his paper appeared) "*naïve*" treatment — misled us all. At any rate, no one should now read, much less teach, his book without practically substituting this article for his chapter on "Emotion."

In this new statement, Professor James claims three elements in emotion: (1) the *direct* reverberation or reaction element, a setback from muscles, organs, etc., in *contrast* to the incoming stimulus which brings about such reactions and in consequence of it. This element

is so excessively emphasized in his book that most of his critics have supposed he meant this alone. But to refute all such he now, perfectly legitimately, I think, brings out the second factor in emotion, *i. e.*, (2) the *associated* mass of content — ideas, etc. — which hangs together, however remotely, with the direct reverberation, and so secures all the power of association as an explaining agent. This he urges with great strength in this article, smiting most of his critics hip and thigh. This principle is fairly included by inference, I think, in his book — although so feebly and dimly that the blame is really his that so much good philosophical print has been spent in making the objections to him which he now fully and clearly sweeps away. I must add that I should not have supposed that he himself had thought out these associative extensions to his theory when he wrote the "Emotion" chapter; for he must have seen that to present them would strengthen his book to an enormous degree. But granted the success of the "association" element which Worcester and others so plainly overlook, Professor James now brings in his third element in emotion, *i. e.*, (3) all pleasure and pain tone in consciousness due to "incoming currents."

Now to say that the *Gefülston* of sensation, admitting that it is involved in the sensation process itself and is not due to a reaction or reverberation, "falls comfortably under my [his] theory" — this is to blow the frog of his original theory up big enough to rival the ox. Why! who is there to oppose a theory which covers everything so "comfortably"? I know of no one, unless it be some radical Herbartian who holds that central *Hemmungsprozessen* can go on in the brain entirely apart from sensory conditions and "incoming currents." If Professor James has meant all along what he now says,

then I for one have shown in what I have written in the foregoing pages about pleasures and pains of "accommodation," both sensory and intellectual, that I agree with him; but it was with a very different understanding of his views that these pages were written.

That I am now right in saying that in his original chapter[1] he takes no account of any elements but those of resonance, muscular and organic, is shown by the following quotations. Under the caption "Coarser Emotions" we read (Vol. II. p. 458): "Each emotion is the resultant of a sum of elements, and each element is caused by a physiological process of a sort already well known. The elements are *all organic changes*, and each of them is the *reflex effect* of the exciting object" (italics mine). And under the caption "Subtler Emotions" (II. p. 471): "In all cases of intellectual or moral rapture we find that unless there be coupled a reverberation of some kind with the mere thought of the object or cognition of its quality . . . our state of mind can hardly be called emotional at all. It is in fact a mere intellectual perception of how certain things are to be called. Such a judicial state of mind is to be classed among awarenesses of truth; it is a *cognitive* act" (italics his).

Moreover, Professor James now sees that he agrees with his critics except on one point, which I think it is the main merit of the whole discussion to have brought to the front. He says:[2] "It may be after all that the difference between the theory and the views of its critics is insignificant." Why? Because — and the following passage shows that it is not James' theory which has become "orthodox," as he hopes, but James himself — "The only feelings which I myself cannot more or

[1] *Principles of Psychology*, vol. ii., chap. xxv.

[2] *The Psychological Review*, i. July, 1894, p. 524.

less well localize in the body are very mild and, so to speak, 'platonic affairs. I allow them hypothetically to exist, however, in the form of the subtler emotions, and in the intrinsic agreeableness and disagreeableness of particular sensations, images, and thought-processes where no obvious organic excitement is aroused." It is true that he made such an admission in his book regarding "subtler emotions;" but it seemed clearly contradicted by the context, and I was one of those associated with Lehmann and Irons who said that such an admission would "give away" the whole theory. Nor do I think we were guilty of an *ignoratio elenchi*, as he now says, although we certainly should be, were we to repeat the charge now.

The final point which James' article brings to a focus may be put in his words: "Must we admit, in the complex emotional state of mind, an element . . . distinct both from the intrinsic feeling-tone of the object and from that of the reactions aroused — an element of which the 'liking' and 'repugnance' mentioned above are the types, but for which other names may in other cases be found?" "Are *these* a third sort of affection, *not* due to afferent currents, and interpolated between feelings and reactions which are so due? Or are they a name for what . . . resolves itself into more delicate reactions still? I incline to the latter view."

I also incline to the latter view and have given, in my *Mental Development*, some genetic reasons for so doing. I am therefore happy to say that I am now with Professor James all along the line, and I hope he may see in the genetic positions stated above some further grounds for his views. But we may still ask — those of us who *now* agree with him, for we are probably many — who has been converted to orthodoxy?

# XI

## THE PERCEPTION OF EXTERNAL REALITY[1]

AMONG the many interesting questions raised by recent discussions in *Mind* on the Cognition of Physical Reality is that of what I venture to call the "Coefficient" of external reality. By coefficient I mean the something which attaches to some presentations in virtue of which we attribute reality to them; while others, not having the coefficient, are discredited. The diametrically opposed solutions of this question of coefficient by Dr. Stout on one hand and, Dr. Pikler on the other is remarked by the Editor[2] in his review of the latter in *Mind*, xv. p. 571.

The opposite solutions which run through and color the history of opinion on this topic are as follows: to one class of writers, the coefficient of the reality of an image is its independence of the will (so Spencer, Stout, Robertson, and innumerable others); to another class, the coefficient is subjection to the will (so Bain, Pikler, etc.). And it is hard at first sight to see how such a flat contradiction can arise between such careful thinkers. My own reflection on the general psychology of belief

[1] From *Mind*, xvi. 1891, pp. 388 ff. The indications of this and the following paper are worked out in a volume on the Psychology of Logic shortly to appear under the title *Judgment et Connaissance* (and in English translation) in the *Bibliothèque de Psychologie expérimentale*, edited by Dr. Toulouse.

[2] The late Professor G. Croom Robertson.

has led me to a point of view from which I am able to see the probable cause of this apparent difference of opinion.

Suppose we make a distinction between a "memory" coefficient of reality and a "sensational" coefficient; meaning by the latter the criterion of present sensational reality; and by the former, the something about a memory which leads us to believe that it represents a real experience (*i. e.*, is not a mere creature of fancy). A moment's consideration will lead us to see that these two kinds of reality differ in their relation to the will. Certainly, a present sensible reality is not under control of my will; it is independent, and if my coefficient is to be discovered in the relation of the presentation to my voluntary life, this must be its expression, and I go over to the class of writers who find the psychological basis of external reality in sensations of resistance. But when we come to inquire into the "memory" coefficient, — asking the question: what character is in a memory-image which testifies to its being a memory of reality? — the tables seemed to be turned. Without stopping to examine other views, I hold that that image is a true memory which we are able *to get again as a sensation* by voluntarily repeating the series of muscular sensations which were associated with it in its first experience. In other words, if it does represent a real former experience, it must have with it muscular (resistance) associates which make it possible for me to change it into a sensational experience again *at my will*. The memory-coefficient, therefore, is subjection to will in the sense indicated. If this be true, the answer given to the main question of belief in objective reality will depend upon whether we look at it from the side of present reality or of reality as remembered.

Further, this memory-coefficient of external reality must be carefully distinguished from the coefficient of memory itself; the latter being the feeling that an image has been in consciousness before, *i. e.*, the feeling of recognition, or of familiarity. I may recognize an image as a true memory, but yet not give it objective reality. The difference between recognition of memory-reality and the memory of external reality, is this: the former can be brought up by proper associates at will, but these associates and the resulting memory have not the sensational coefficient after we get them: that is, they are not individually independent of the will. While, as is said above, the getting again of a remembered reality in the external world is by a series of sensational (resistance) associates, and the resulting experience when reached is a sensation independent of the will. In Hume's phrase, "an opinion or belief is a lively idea related to or associated with a present *impression*." A true memory, in short, is an image which I can get at will by a train of memory associates, and which, when got, is further subject to my will; a memory of external reality, on the contrary, is an image which I can get at will by a train of sensational associates and which, when got, is not subject to my will. Of the two, the former is important for the psychology of belief in general; the latter only for the theory of belief in external objects.

These three factors in belief appear clearly in this example: — An infant, after certain muscular movements, enjoys the contents of his food-bottle; here is the sensational coefficient of external reality. Again, his bottle lies before him, he reproduces his enjoyment by voluntarily repeating the muscular series which before led up to the enjoyment; to do this he proceeds upon memory-coefficient of external reality. Being satisfied

and drowsy, the bottle-image comes up in his consciousness by association with the memories of the muscular movements, the real movements not being made nor the enjoyment reached; here is the coefficient of memory. Once more the bottle-image comes up, he makes the muscular movements, but fails to get the satisfaction; the memory-coefficient is not supported by the sensational coefficient, — he is so far under illusion.

As illustrating the two coefficients of external reality and their confusion, Dr. Pikler in *Mind*, No. xv. p. 396, brings against Dr. Stout's view that interruptions of regularity determine objective belief, the objection that such interruptions occur in the subjective order but are not — as interruptions and quite involuntary — part in the objective (sensational) order, overlooking the alternative that such images usually bring up associates which throw them into the memory-order. And Dr. Stout seems quite right in saying that when there are no such associates they are put in the sensational order (*Mind*, No. xv. p. 549). In arguing that reality finds its criterion in subjection to the will, I think both Professor Bain and Dr. Pikler have in mind the memory-coefficient of reality — answering the question put by Mill: "What is the difference between thinking of a reality and representing to ourselves an imaginary picture?"

What could be clearer evidence that Professor Bain refers to the possibility of getting reality voluntarily than this quotation: "Our belief in the externality of the causes of our sensations means that certain actions of ours will *bring the sensations into play or modify them in a known manner?*" Dr. Stout quotes this and adds (*Mind*, No. xv. 33): "I utterly fail to see how dependence on my own activity can mean the same as depend-

ence on something other than myself;" which simply means that Dr. Stout "utterly fails" to see the dual bearing of the external-reality problem.[1] Professor Bain in this quotation is recognizing the memory-coefficient, and thus getting a basis for persistence in external objects; and I think he is not open to the charge of having entirely overlooked the sensational coefficient. What Dr. Stout calls Professor Bain's "obvious paradox" is seen, from what I have already said, not to be a paradox, but a complexity in our belief in objective existence.[2]

In Mill there is almost exclusive appeal to the memory-coefficient,[3] and hence the confusion lurking in his definition of reality as "the permanent possibility of sensation." It is true, as Stout says, that a possibility is nothing until it is brought to the test of sensation; but it is equally true, as Pikler says, that a possibility (of getting) sensation may carry belief without such a sensational test. In the former case, we ask for the sensational coefficient to the exclusion of the other, and in the latter case we rest on memory to interpret the "possibility" apart from present sensation. In short, Mill's formula may be modified to be true to either coefficient, but not to both; while as it stands it is true to neither, but favors the memory construction. To express the sensational coefficient, it should read *permanent neces-*

[1] See the later exposition in Stout's *Analytic Psychology*, ii. p. 248, in which he admits the memory coefficient to a subordinate place. The present writer holds (1902) that the belief in the "persistence," as additional to the "present existence," of the external world is due to this factor.

[2] For Professor Bain's clear recognition of both aspects, see *Emotions and Will*, 3rd ed., pp. 578–581.

[3] See especially pp. 234–238 of his *Exam. of Hamilton* (American edition). The appeal becomes exclusive in Dr. Pikler's book, *The Psychology of the Belief in Objective Existence.*

*sity*[1] *of certain sensations;* and to express the memory coefficient, it should read *permanent possibility of getting for myself certain sensations.* But for an adequate theory either aspect is insufficient, because it neglects the other.

We might call the sensational coefficient (an object's independence of our will) the *primary* criterion of belief in external objects, and the memory-coefficient (the voluntary getting of sensations which resist) the *secondary* criterion. And an adequate formula, to do justice to both, would have to run somewhat thus: — *Belief in external reality is a feeling of the necessary character of sensations of resistance, and of my ability to get again certain sensations of this kind at any time.*

I believe, however, that a simpler formula may be suggested: a formula which will hold that belief in general is a feeling attaching exclusively to objectives, its criterion or coefficient being lack of subjection to the will; that belief in external reality is its very earliest exhibition; and that the belief of which subjection to the will is the criterion is a derived feeling anticipatory of sensational confirmation — just as the memory of which it is the accompaniment is derived and referable for its material to the sensational process. But my present object is only to make clear the issue, and to point out the waste of effort that results from failure to distinguish carefully the two points of view. Among recent writers

[1] The element of necessity (resistance) in certain sensations must be added to enable Mill to meet the ordinary common-sense argument that (in his words) "all mankind, unless they really believed in matter, would not have turned aside to save themselves from running against a post" (*loc. cit.* p. 244); for mankind do not turn aside except when the possibility is of a certain kind of sensations. And he fails to meet the objection to his formula (really the same one) that it gives mankind no means of positively avoiding the post, *i. e.*, by voluntarily bringing about experience of other realities.

I think no one else does such justice to both sides of the problem as does Lipps.[1]

[1] *Grundtatsachen des Seelenlebens*, ch. xvii., particularly pp. 397 ff. The reader may now consult the article "Belief" in the *Dictionary of Philosophy and Psychology*, vol. i., 1901, by the present writer, which is initialed also by Stout; citations of later important literature may also be found there. Stout's more recent formula, to the effect that belief arises under conditions of "limitation of activity," goes far to reconcile the opposed points of view.

# XII

## FEELING, BELIEF, AND JUDGMENT[1]

In the review of my *Handbook of Psychology, Feeling and Will*, in the last number of *Mind* (N. S. No. 2, p. 272), Miss Lowndes touches upon points of such importance that further discussion of them may be interesting, apart from my desire to be clearly understood. The nature of feeling in general, and the relation of belief to feeling and to judgment, are both problems of capital interest. First, briefly, what is feeling?

For what follows, let us understand by feeling simply sensibility; the amount, intensity, agitation, of consciousness. It is consciousness itself, a "first intention" — consciousness in its simplest expression, but consciousness as present, also, in the highest operations of knowing and willing. The mollusk — and perhaps the sensitive plant — does not know anything, nor will anything, but feels.[2] As a matter of fact, we find that we feel differently during the predominance of different functions.

[1] From *Mind*, July 1, 1892, pp. 403 ff.

[2] This conception is clear enough, it seems to me, especially when viewed from the biological side. Yet Miss Lowndes construes me as limiting Feeling to egoistic Emotion (*loc. cit.*, p. 274). In saying that Feeling has "reference to self" (*Handbook*, i. 36), I do not mean, of course, the *presentation* of self; but simply the conscious area, the inner aspect, belonging to my organism. In the very same sentence, I say, "states of feeling may entirely lack any presentation or knowledge element." Miss Lowndes' criticisms rest, for the most part, on evident misapprehensions such as this.

When I am striving and straining, my state of feeling is very different from my state when I am listening passively to an uninteresting lecture; and both states differ greatly from such an emotion as anger. Now the second question which I wish to ask is this: how do we feel when we believe? — when an article of faith is just becoming an article of faith?

As to the general theory of belief, I may refer the reader to the book which is now under discussion. What I wish to point out here is that after the elements brought out by analysis have been assigned to their proper categories (impulse, volition, presentation, etc.), what is ultimately left over is a feeling-factor. There is impulse in belief: all things believed belong to certain categories, have certain coefficients, toward which we feel impulses which are, for consciousness at least, original and after which we strive. There is likewise presentation or representation, usually both, in belief: for we believe a content, an objective. But impulses, representations, and volitions might be present to eternity without belief. Note the vegetative biological satisfactions of the newborn, our voluntary performances of organic functions, and, in a higher sphere, the objects of our ethical and æsthetic gratifications, which remain largely a matter of uncritical and unreflective presence — what I call "reality-feeling." We stumble upon the beautiful and good, and they please us; but their presence, and our gratification from their presence, do not afford us any clear criterion or coefficient by which we may accept them as beautiful and good.

Now admitting that the acceptance, endorsement, ratification, of an objective is necessary to constitute Belief, shall we call it Judgment with Brentano, and on the strength of its priority, make Judgment an irreducible

function co-ordinate with Presentation (*Vorstellen*) and Feeling; or shall we attempt to analyze it further?

The need of analysis is seen in the conflicting views of judgment, logical and psychological, now current. The current divergence of view is shown by the comparison of Erdmann's *Logik*, and Hillebrand's *Die neuern Theorien der kategorischen Schlüsse*. Hillebrand accepts Brentano's view of judgment and develops it in its logical bearings. This view seems to be psychological in two of its factors: (1) It emphasizes an aspect of existential judgments which is not covered by the ordinary predicative theory; namely, if existence is a predicate in the ordinary attributal sense, it must have a notional content of its own — it must be itself a content, an earlier presentative experience — an error which Kant refuted once for all in his criticisms of the ontological proof for the existence of God. But the formal logicians (*e. g.*, Erdmann), reply: if existence is not a predicate, the distinction between presentation and judgment is subverted. This last is unanswerable, but it leaves unrelieved the acute strain between the psychological and logical views of the existential, pointed out by Brentano. (2) The Brentano-Hillebrand view does justice for the first time to the "unitary" or "conceptual" meaning of judgment and syllogism; a point of view from which the formal strictly predicative or "two-membered" doctrine of judgment appears at a great disadvantage. When I say "the dog is fierce," my content is a single object, *fierce dog* — this much certainly, whether or no we go over to the existential view which says, "the fierce dog is" is equivalent to the original statement (*cf.* the writer's *Handb. of Psychol.*, I., pp. 285, 301). Indeed, Brentano seems to go over to the existential view, thus saving himself from the criticisms to which

his doctrine is open, at the same time that he cuts himself off from a predicative theory by his unitary view of the judgmental content.

Yet it is curious to note how the logical progressus of doctrine may be reversed. Erdmann holds the predicative theory, yet maintains the unitary view properly belonging to the existential theory. This he does by upholding what may be called the "declarative," as opposed to the synthetic function of judgment (*Logik*, I., pp. 205, 261). For this, there is much to be said. The present writer has remarked (*ibid.*, pp. 283, 285): "The essential feature of judgment is this, that it sets forth, in a conscious, contemplative way, the actual stage of the thought movement." Erdmann holds (*loc. cit.*, I., p. 262) "that it is always expressed in a proposition." But how easy it would be to reverse this chain of argument, and to say that because there is this declaration of relationship between parts of the objective whole which is the content of judgment, there must have been originally more than one content, and that, therefore, judgment, as a synthetic thing, precedes presentation and renders it possible.

The view of judgment which is desiderated, therefore, should have the following features: first, it should find some way of holding that existence is a true predicate and yet not an attributal content; second, that the content of judgment is a single concept; third, that reference to existence accompanies all judgment; and fourth, that judgment is declarative of results already reached in conception. The first and third of these four points are essential, if the existential and predicative theories of judgment are to find any common ground.

On the first point — the nature of the existence predicate — consciousness seems to throw light. Reality is at first simply presence, sensation, presentation; we have here

that fundamental phase of affective consciousness, reality-feeling. There is no judgment at all, because there is no occasion for assertion. There is no acceptance of reality as such, because there is no category into which to put it. But now let experience come in like a flood, let pleasures of gratification be succeeded by pains of want, let impulse seek its end, finding it here and losing it there; and amid the contradictions and reiterations, the storm and stress of the accommodation of life to the world, a few great relief-points begin to stand out in consciousness. They recur, they satisfy, they hold together, they can be found when wanted. They are not new as objects of apprehension; they are the same objectives as before. But somehow, after we have gratified our appetites by them, and have sought and found them, again and again, holding firm together, while other objectives have shifted, faded, and disappeared — then the mental part of us which envelops them becomes different. Our affective consciousness now assumes the coloring which we call belief; that sense of acceptance, assurance, and confirmation which succeeds doubt and perplexity. This is feeling; a feeling of the methodical way in which certain objectives manœuvre in contrast with the unmethodical way in which other objectives manœuvre, — the feeling of a reality-coefficient.

This, then, is the primary meaning of belief in reality or existence. It is the sense of the confirmed presence of an objective, as satisfying the demands of conscious life. But so far, belief is not judgment, and existence is not an idea. But so soon as such an objective is labelled as real, is pictured with this coefficient, then the declarative, assertive phase of consciousness arises, and the "S is" is born — a true predicative judgment. What was before the feeling-envelope, so to speak, of the presentation, is

now itself presented as part of the content. Hillebrand seems to be right in saying that the idea of existence does not arise before, but in and through, the existential judgment.

In the predicate of the existential, therefore, what we assert is not content over and above the subject S, but the feeling-category in which the S-content is enveloped in consciousness: the way consciousness feels in consequence of the presence of this particular content in it. This is, in the writer's view, the true explanation of the existential. It is a judgment, because in its declarative function it renders in intelligible form the endorsement which distinguishes belief from simple presentation. But the predicate is only a sign of this endorsement, not an added objective element.

The other desideratum of the theory is now clearly in sight, *i. e.*, the presence of an existence-value always in judgment. As experience broadens, our reality-coefficients are so well established as categories of feeling-consciousness, that each presented content has its familiar envelope of belief, its endorsement in kind — so familiar and natural that it is not formally asserted at all. And the new marks which accrue to a content in conception come to be declared in the ordinary "two-membered" form of judgment, all inside of a tacit (felt) reality-coefficient. The *is* of "the man *is* white" is, therefore, very different from the *is* of "there *is* a white man." The former is merely the sign of conceptual synthesis: the judgment might be true in any "world of reality," *e. g.*, of Adam Bede. The existence-value of the judgment is simply the environment of feeling which an accepted proposition carries, with no indication of any particular kind of existence. But in the true existential — "there *is* a white man" — the feeling factor

is taken up as a quasi-logical predicate, and the coefficient of external reality is declared. The *is* now expresses the conscious ratification and declaration of belief.

The employment of the belief criterion as a norm of classification of judgments[1] is fruitful in further confirmation of this general result. If we look at the belief-attitude of the mind in cases of assertion, we find two clear truths not brought out by the ordinary division of the logics. First, the disjunctive judgment is seen to be a categorical form of expression. The disjunctive form of the predicate, "P or P′," means that the same belief-feeling accompanies either of two or more declarations concerning the subject S. It expresses the belief-value of the concept S as far as constructive experience of it (*i. e.*, the evidence) is found to be of value. With more evidence, the parity of P and P′, as claimants upon belief, disappears, and the judgment takes the regular categorical form. Second, the hypothetical judgment lies, with reference to belief, midway between the ordinary categorical and the existential. We may approach it from either extreme. For example, the judgment "if *a* is *b*, *c* is *d*," means that the same degree of reality, or belief-feeling, accompanies the conceptual synthesis *ab*, on the one hand, and the synthesis *cd*, on the other hand. But it does not determine the particular coefficient of reality belonging to either *ab* or *cd*. Or we may approach the hypothetical from the side of the existential, getting the hypothetical judgment of existence, "if *ab* exists so does *cd*." In this case, not only does the belief-feeling envelop both *ab* and *cd*, as before; but, further, the particular coefficient of reality attaching in common to them both is now expressed. This last form of judgment is, therefore, from our present point of view, the richest

[1] See Venn, *Emper. Logic*, 243; Baldwin, *Handb. of Psychol.* 1ed., i. 293.

and most notable. In it we catch both belief as felt coefficient, and existence as asserted predicate (*i. e.*, the reality-coefficient made the P of predication).

The above account, it will be seen, suggests an explanation also to the negative existential judgment — a point of great difficulty to Herbart, Brentano, and Hillebrand — by saving the predicative force of the existence-sign. Yet by the negation in this judgment, as now explained, no element of content is cut off from S; what is denied is belief in a positive coefficient of reality; or as Erdmann[1] and Sigwart say, it is the rejection of an attempted positive judgment of existence.

The element of belief which accompanies all judgment, described above as felt recognition of a reality-coefficient, gives us the line of separation between formal and material logic. The judgments A, E, I, O, cannot be purely formal, nor can the syllogisms constructed from them; for every S and P in each one of them has its belief-value — its reality-coefficient — and every actual case of inference means the development of concept subjects to the limitations of thought in that particular sphere of reality. This reference to reality is probably what Hillebrand is contending for in his doctrine of "Double Judgments," so far as I understand it. The truth of every conclusion rests upon the presupposition from the supplying of which the hypothetical syllogism arises, just as the hypothetical judgment arises from the supplying of the ground of Belief in the categorical judgment that the two premises have the same kind of reality. The syllogism: —

A is B
B is C
A is C,

[1] *Loc. cit.* i. 349 ff.

to be valid, really requires belief that the proposition, *If A is B and B is C, then A is C*, applies to the particular elements of content in question. Without this presupposition, securing the same coefficient to both premises, the conclusion would be false; as, for example: —

> All men who have died will rise again,
> *The man Romeo died*,
> *The man Romeo* will rise again.

The "man Romeo" and the "all men" have different coefficients of reality — different material reference, as is indicated by the difference of type — and the conclusion is invalid.

# XIII

## I. Memory for Square Size[1]

The experiments of this study were performed at Toronto (by the present writer with Mr. W. J. Shaw), during the winter of 1892–3. The object was to determine the accuracy of the memory for *size*, as affected by the lapse of time. A figure of two dimensions was selected for experiment because of the tendency to measure linear size in terms of well-known units of length. Circles tend to be measured by their radii, but in the case of the square, the impression is that of the area, and the natural memory-image is not so liable to be corrected by comparison with standards fixed in mind by repeated experience.

The experiments proceeded by three different methods. (1) *Selection from a Variety.* A single figure (the *normal*, 150 mm. square) was drawn on a blackboard and shown to a large college class; after a certain time a number of squares of various sizes were shown simultaneously, and the class was requested to designate the one that appeared to be the same size as the normal. The squares ranged from 130 to 210 mm. by intervals of 20 mm., and the time intervals were 10, 20, and 40 minutes. The class consisted of about 225 persons, of

[1] From *The Psychological Review*, May, 1895. Reported by Professor H. C. Warren to the American Psychological Association, December, 1893. (*Cf.* the Abstract in the *Proc. Amer. Psych. Ass.*, 2nd Meeting, 1893.)

whom some 50 were women. (2) *Identification.* Here the normal square was first shown, and afterwards one other square; the subjects were asked to say whether the latter appeared to be greater, equal to, or less than the normal. The time intervals were the same as before, and the second square was in every instance 20 mm. greater than the normal.

Both series were treated by the "method of right and wrong cases," and the two results showed remarkable agreement. The percentage of right cases is shown in Table I.

TABLE I

| | I. By Selection. | II. By Identification. |
|---|---|---|
| 10 min. . . | 64.1 | 87.6 |
| 20 " . . | 59.3 | 82.7 |
| 40 " . . | 36.4 | 58.5 |

Plotting the results (Fig. 1), we find the *memory curves*, as they may be called, practically parallel, but the degree of accuracy is much higher by the second method than by the first. In each there is a rapid falling off at first, then a period of gradual descent, and finally another rapid drop. The greater accuracy of the results in II is partly due to the manner of stating the question. Should the memory-image of the normal square either remain unaltered, or decrease in size, the subject would respond correctly that the second square was the greater, and he would respond incorrectly only if his memory-image had *increased* sensibly in size from its original. Whereas, in the series by Selection his

responses would be classed as incorrect if his memory-image had *either increased or decreased* sensibly. A further source of error in the series by Selection was the disturbance due to simultaneous contrast between the figures. Some special experiments were afterwards made to determine the effect of this contrast (see II, below).

In discussing the form of the two memory-curves so reached, it should first be observed that their real origin is not at A, but at a point, or points, near B. For the

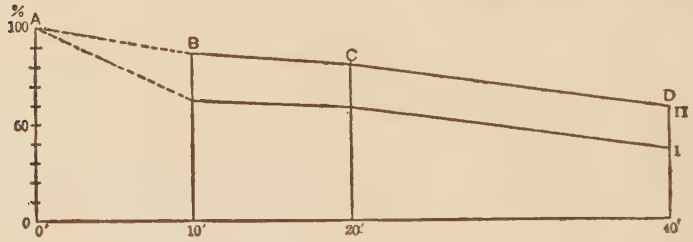



FIG. 1.

Curves for the methods of Selection (I) and Identification (II). Vertical lines give percentage of correct cases. Horizontal divisions give time intervals in minutes.

difference of 20 mm. is very much greater than the least perceptible difference between two squares observed in immediate succession; hence, even if a considerable interval should elapse before the second square is shown, *no incorrect judgment will be given.* The effect of this is to make the first falling off, when once it begins, even more rapid than is indicated in the diagram, and possibly also to carry out the parallelism between the two curves still further. The reason for the sudden falling off may lie in the conditions of the experiments. The subjects began to take notes on a lecture immediately after the normal square was shown, and there was consequently a

sudden withdrawal of attention from the memory-image, allowing it to decrease greatly in distinctness at once. After this first influence had taken effect, there was, it seems, but little change until the ordinary factors which tend to make the image more vague began to take effect. The work of these factors, which one would scarcely expect to become apparent within 40 minutes, may have been hastened by the fatigue arising from steady application.[1]

(3) The third series proceeded by what was termed the *Method of Reproduction.* A normal square having been shown, as before, the subjects were asked, after the stated interval, to draw on paper a square of the same size. The normal in this case was 170 mm. square. The reproductions were almost always too small, their average being 146.0 after 20 minutes and 146.4 after 40 minutes. This result was rather unexpected, as the other series had indicated a tendency of the memory-image to increase in size beyond the original. It may be attributed to two factors: (1) The muscles of the hand were fatigued from continuous writing, and this tended to give the impression of a figure larger than that actually drawn. (2) The paper on which the drawing was made was not much larger than the actual size of the normal; any figure coming close to the edges would appear very large, since it occupied so large a portion of the field. Hence there was a tendency to draw the square too small. On this account it was decided to separate the results obtained by this method from the others, in which the conditions were more nearly alike.

[1] The results were examined for a possible difference between the two sexes, but the variations were neither marked nor constant in direction.

## II. Further Experiments on Memory for Square Size[1]

The experiments were taken up at this point by Messrs. Warren and Shaw, at Princeton. A possible objection to the Selection Method lay, as has been said, in the disturbing influence of simultaneous contrast. To investigate this, the following experiment was performed: Ten squares, ranging between 100 and 190 mm., were drawn in promiscuous order on a large sheet of paper; on another sheet of the same size a single square was drawn as normal, and the two sheets were placed in different rooms. The subjects observed the normal first, and going at once to the other room designated the square which appeared equal to it. The normal used was 120 mm. in one instance and 170 mm. in another. In each case there was a marked *attraction towards the centre of the series*, the average for the normal of 120 mm. being 123.3, and for that of 170 mm., 165.

On this account it seemed desirable to supplement the Toronto experiments by others, and to employ a somewhat different method, using a series which combined the advantages of Selection and Identification. The object was to determine the threshold, *i. e.*, the (average) least perceptible difference from the normal after a given period of time. In each experiment the normal was first shown, and after the interval another square as near the threshold as the latter could be determined from the previous experiments; the experiments were continued until the threshold was found. When the squares were shown in immediate succession (interval of

[1] This section is by Professor H. C. Warren and Mr. W. J. Shaw.

*no* minutes=perception), the threshold was found to be 3 mm. for squares of about 150 mm. When the interval was increased it was found to make an essential difference whether the second square was the larger or the smaller. For an interval of 10 minutes the threshold was 8 mm. if the second was smaller, while it was but 5 mm. if the second was larger; for 20 minutes it was somewhat less than 8 mm. if the second was smaller, and less than zero (a minus quantity!) if the second was larger; that is, when two squares of the same size were shown, 20 minutes apart, *the second was pronounced the smaller* by over 50 per cent of the subjects (actually, 63 per cent).

That this result was not accidental (the conditions rendered any collusion impossible) was proved by the substantial agreement of all the experiments, pointing as they did without exception in the same direction. The entire series (marked *a* in Table II) was performed on the same objects, a college class of about 50, Juniors and Seniors, on nine separate occasions, the 10-minute intervals being taken first. Besides this the table shows two experiments (marked *b*) on two other college classes of 50 and 65 respectively, where squares of 150 and 160 mm. were used, with a 20-minute interval, the normal being smaller in the former case and larger in the latter. The lack of practice makes the threshold much greater in these instances than in the others, but they exhibit a similar difference, depending on the order of sequence. The line of values marked *c* shows the experiments on squares immediately succeeding one another (0 minutes interval), taken with still another set of subjects, and the two values marked *d* are taken from the earlier experiments by Identification.

These results unite to show that besides the growth of inaccuracy, or indistinctness, in the memory-image,

there is another factor at work, by which *the memory-image tends to grow larger* as the time interval increases. The table gives three cases which allow direct comparison between an increasing and a decreasing sequence: (1) With unpractised observers (see *b*), 10 mm. *increase*

TABLE II

| Interval and order. | Difference between I (normal) and II. | | | | | | |
|---|---|---|---|---|---|---|---|
| | 20mm. | 12mm. | 10mm. | 8 mm. | 5 mm. | 3 mm. | o mm. |
| o min. II<or>I | — | — | 95 (c) | 87 (c) | 63 (c) | 4 mm.= 59<br>2 mm.= 44<br>(c) | 85= (c) |
| 10 min. II<I | — | — | — | — | 50 (a) | — | — |
| 10 min. II>I | 87 (d) | — | 70 (a) | 53 (a) | — | — | — |
| 20 min. II<I | — | — | 75 (b) | 94 (a) | 75 (a) | 65 (a) | 63< |
| 20 min. II>I | 82 (d) | 82 (a) | 37 (b) | 67 (a) | — | — | 24=<br>13> (a) |

The figures denote percentage of right answers, except under o mm., where they denote the judgment (=, >, or <,) actually made. The normal was 150 mm. square.

from the normal was noted by only 37% after 20 minutes, while the same amount of *decrease* was noted by 75%. (2) With practised observers (*a*), 8 mm. increase was noted by 67%, and the same decrease by 49%. (3) With the same observers as (2), the final test, after considerable practice, was with two equal squares, separated by

20 minutes interval; 63% pronounced the second square smaller, 24% equal, and 13% larger. Comparing this with the observations on the threshold for perception, we see that while half of the subjects can distinguish a difference in the latter case only when it amounts to 3 mm., in case of a 20-minute interval a majority actually think they perceive a difference *when none exists*, indicating plainly that their memory-image has grown by more than 3 mm., apart from any increase in the extent of the territory lying "below the threshold."

These results are not so satisfactory as the earlier series (see Table I) for determining the actual law of the threshold, on account of the increased degree of practice as the experiments proceeded. But they bring out clearly this fact of the growth, or *exaggeration*, of the memory-image.

The close of the college year prevented an extension of these experiments to intervals of 40 minutes with the same set of men.

A word or two may be in place here regarding the relation between single experiments on a number of subjects and a series of experiments on a single individual. In any experiments where a number of results are combined and their averages taken, what is sought is a *representative* value. By multiplying the trials, accidental influences are eliminated and we obtain a value representative of the given individual under the given conditions. If the individual represents some peculiar type, we should further compare his results with those obtained from individuals of other types. If, however, what we desire is the observation of an *average individual*, we must make sure that our object is such, by comparing him with others. Rather than repeat the entire series on several individuals, we may save time

and labor by performing a single experiment on a number together. There are then a number of precautions to be taken. (1) Each subject must understand perfectly the nature of the judgment to be made. (2) The judgments must be entirely independent. (3) The subjects must be representative — not drawn from some one peculiar class; and they must be governed by sensibly the same conditions. (4) Finally, care must be taken with the *objective* conditions of the experiment, so that no vitiating circumstances shall creep in. — In the present instance, every precaution was taken to fulfil the first two and the last of these requirements, and, a number of doubtful results having been rejected, the remainder fulfilled the conditions exactly, so far as a most careful scrutiny and attention on the part of the two observers could determine. Further, the subjects were acted upon by sensibly the same conditions during the given interval. There is, of course, room for variety of opinion as to how far representative a college class is to be considered, and what allowances, if any, should be made for differences in previous occupation and differences in location with reference to the platform where the squares were shown. The writers are inclined to minimize these differences, and as to the former question, it is urged that a body of men like those under consideration are representative of the average educated male of twenty-one years. We believe the results to be far more satisfactory than a quantity of experiments on merely one or two individuals, and think that this *cumulative* method, under which alone are possible certain experiments involving a great amount of time, may safely be used in connection with the more usual procedure.

# XIV

## THE EFFECT OF SIZE-CONTRAST UPON JUDGMENTS OF POSITION IN THE RETINAL FIELD[1]

I. *Problem, Apparatus, and Methods.* — The indication given in the preceding paper that the arrangement of squares of various sizes in the visual field has an influence upon the identification of one of them as of a certain remembered size, suggested a farther research. It occurred to the writer that any influence of contiguous squares upon each other would be accurately measured by their joint influence upon the subject's estimate of some other distance in the visual field. Such a distance as that lying between the squares lends itself directly to this purpose.

An arrangement was readily effected, whereby the ratio of the sides of two squares to each other was varied in a series of values, while the distance between the squares was kept constant. Any regular variations then in the judgment of this latter distance, such as that of its mid-point, — *i. e.*, the bisection of the distance between the squares, — would be due to the variations in the ratio of the square-sizes. Such a problem shows practical bearings also in all matters which require estimates of balance, division, proportion in right lines between masses, objects, etc., in the field of vision: such matters as the hanging of pictures, designing of cuts, vignettes, architectural plans, etc., involving line values.

[1] From *The Psychological Review*, May, 1895.

Of course all variations from the correct location of a mid-point, or other critical point, lying between two masses of material, color, etc., should be allowed for in applying the formulæ of æsthetic effect.

A further complication also arises when movement enters into the case: the movement of the contrasted masses toward or from each other, of the eye from one to the other along the line of connection, or of the element of this line whose evolution describes the line.

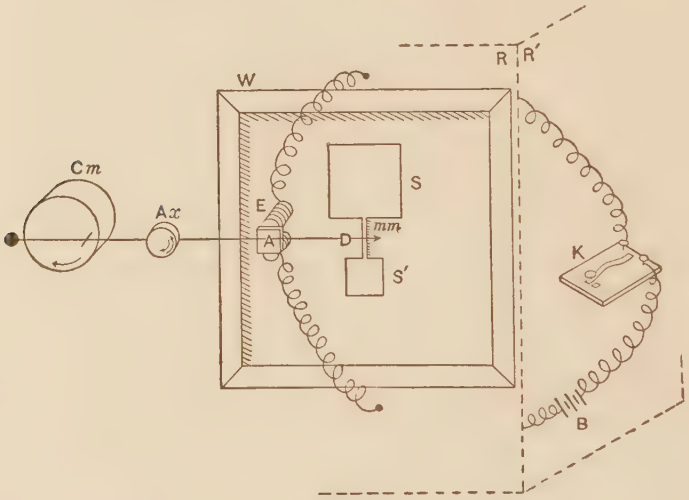



Fig. I.

*Experimental Arrangements.* — The following description (with Fig. 1) of my device for investigating the problem is given in some detail, since it meets the essential requirements of such experimentation and is so simple in principle that it may be adopted by others who desire to carry this kind of experimentation further.

The dark room (R) communicates with room I (R′) by a single window (W) which is completely filled with

white cardboard. In this cardboard two square holes are cut (S and $S^1$) whose sides are of determined ratio to each other, and whose distance from each other is measured by a slit bearing a known ratio in length to the side of the larger square. On the wall beside the window (at Ax) is fixed the axis of movement of a long needle which is moved upon this axis by a pin carried round the face of the clock motor (Cm) of a Rothe polygraph. The movement of one end of the needle upward by the pin and downward by its own weight, is reversed by the other end of the needle, which so carries an arrow-head or pointed marker up and down the mm. scale marked upon the slit. The needle bears at A the armature of an electromagnet. The magnet (E) under the armature is fixed to the cardboard and its connections are carried into room R′ and terminate in a punch-key (K) on a table directly in front of the window W. The reagent sits at this key, and closes the current when the needle reaches the mid-point of the slit; the needle is arrested by the attraction of the magnet (E), and the reading is given on the scale *mm.* The apparatus works automatically, giving a series of experiments, with alternating up and down movement of the needle, until the motor runs down. A gas jet in room R is focussed through a large reading lens upon the scale *mm.*, converting the small point of the needle seen by the reagent from the other room, into a moving bead of light; the background of the squares and of the slit is the black of the dark-room wall, and the whole is seen by him upon the white surface of the cardboard.

For the horizontal arrangement of the squares, the whole apparatus is simply shifted 90°, bringing the axis of movement of the needle below the window.

With the arrangements thus described experiments

were carried out on two persons; Sh., (W. J. Shaw) and T. (G. A. Tawney), with results as given in this report. Both were practised in psychological experimentation, but Sh. more than T.

In the case of each, the series of values of the ratio $\frac{S^1}{S}$ was $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$, $\frac{1}{16}$, which gives, when S has the constant value of 20 cm., the following series of values for $S^1$, *i. e.*, 10, 5, 2.50, 1.25 cm. A constant value for the distance between the squares was selected which seemed about as likely to occur in ordinary arrangements and experiments as any other, *i. e.*, $\frac{1}{2}$ S = 10 cm.

The experiments were performed in series of 20 to 25, called each a "lot," only one lot being taken at a sitting to avoid fatigue of the eyes. The time of day was kept constant, the subject was kept in entire ignorance of the object of the research and of the results he gave, and was asked after each series to give any impressions he might have of the accuracy of his results, and of the variations which he made, if any, in his method of identifying the mid-point. Careful record was kept of all these impressions, and they turned out to be valuable.

*Methods of Identifying the Mid-point.* — The two reagents began at the very beginning of the experiments to describe their procedure differently — a difference which was persisted in and became in the sequel a matter of fundamental importance. Sh. tended to fix his gaze upon the moving bead of light; followed it in its course, and stopped it when it reached the mid-point. This, it is evident, involves an element of eye-movement through a series of positions corresponding in extent directly to half the line. This I shall call the "approach method" — seeing that the mid-point is selected only as it is approached by the light-bead.

T., on the other hand, tended to select the mid-point first; and endeavored to hold it fixed until the light-bead reached it, then stopping the bead by his reaction. This evidently gives a result largely independent of eye-movements on the line, and this may accordingly be called the "fixation method. It will be seen below that certain consequences follow from this difference of method.

*I. Approach Method. Vertical Arrangement. Results of Sh.* — The result of 770 experiments with the vertical arrangement upon Sh., who used the "approach" method, divided into 5 series of 6 lots each, are shown in Table I. In the "vertical arrangement" the larger square was above the smaller in all cases. The variable error is not given in any of the tables, since it fell below the limit of accuracy of the apparatus, *i. e.*, the diameter of the light-bead. The uniformity in direction of the constant error is shown in the small number of exceptions or minus judgments given in the column "Excpts." in the table. The words "down," "up," "both," signify the direction of movement of the needle.

TABLE I. — Sh. App. Method. Ver. Arrgt.

| No. Exps. | Ratio of Sides in cm. | Mean Var. in mm. | | | Excpts. |
|---|---|---|---|---|---|
| | | Both Directions. | Down. | Up. | |
| 155 | 20:10 | 2.35 | 2.7 | 2. | 6 |
| 150 | 20:5 | 3.6 | 3.95 | 3.2 | 2 |
| 150 | 20:2.50 | 3.89 | 4.27 | 3.52 | 0 |
| 150 | 20:1.25 | 4.4 | 5. | 3.8 | 0 |
| 165 | 20:0 | 2.8 | 2.93 | 2.66 | 1 |

The consideration of the figures given in this table enables us to formulate the following statements for the

case in which the eye follows the stimulating bead to its point of arrest, up and down a vertical line:

1. There is a tendency to fix the mid-point too far away from the larger square (positive values of mean var.).

2. The direction of the tendency to error has practically no exceptions.

3. This tendency varies in some direct ratio with the ratio of the sides of the two squares to each other; *i. e.*, from .01215 of the side of the larger square when its ratio to the side of the smaller is 2: 1, to .02 of the side of the larger when its ratio to the smaller is 16: 1.

4. At the limiting value (0) of the side of the smaller square, the tendency to locate the mid-point too far away from the larger square is about the same as when the sides of the two squares are in the ratio 2: 1.

5. The tendency to error is from 16 to 25 per cent stronger when the stimulating object whose location is fixated is in movement in the same direction as the tendency of error (down), than when it is in movement in the opposite direction (up).

TABLE II. — Sh. App. Method. Hor. Arrgt.

| No. Exps. | Ratio of Sides in cm. | Mean Var. in mm. | | | Expts. |
|---|---|---|---|---|---|
| | | Both Directions. | Right. | Left. | |
| 100 | 20:5 | .9 | 1.95 | .33 | 20 |
| 50 | 20:2.5 | 1.67 | 2.5 | .7 | 4 |
| 50 | 20:1.25 | 2.73 | 3. | 2.46 | 2 |
| 50 | 20:0 | 2.1 | 2. | 2.2 | 3 |

*II. Results of Sh. Horizontal Arrangement.* — Passing now to the horizontal arrangement, in which the details

of apparatus remained the same as for the vertical, I may report as before for the two methods. The larger square was placed to the left, the smaller to the right, and the bead of light moved right and left over the slit between. The variations in the side of the smaller square gave as before the series of ratios to the side of the larger, $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$, $\frac{1}{16}$.

From the examination of Table II we gather the following results:

1. There is a practically uniform tendency of error away from the larger square.

2. This tendency varies in some direct ratio with the ratio of the sides of the two squares to each other.

3. The magnitude of the error is from .9 to 2.2 mm., *i. e.*, .005 to .01 of the side of the larger square.

4. At the limiting value (0) of the side of the small square the tendency is slightly less than when the ratio of the two sides is 16 : 1.

5. This tendency is about $\frac{1}{2}$ greater when the movement of the stimulus fixated is in the direction of the error itself (right) than when it is in the opposite direction (left).

TABLE III. — T. Fix. Method. Ver. Arrgt.

| No. Exps. | Ratio of Sides in cm. | Mean Var. in mm. | | | Excpts. |
|---|---|---|---|---|---|
| | | Both Directions. | Down. | Up. | |
| 84 | 20 : 10. | 2.96 | 1.99 | 3.85 | 4 |
| 150 | 20 : 5. | 2.86 | 3.11 | 2.64 | 1 |
| 150 | 20 : 2.5 | 3.31 | 2.21 | 3.83 | 0 |
| 150 | 20 : 1.25 | 2.83 | 2.35 | 3.3 | 1 |
| 149 | 20 : 0 | 1.05 | .8 | 1.35 | 21 |

*III. Fixation Method. Vertical Arrangement. Results of T.* — The results of 683 experiments with the vertical arrangement upon T., who used the fixation method, divided into five series of six lots each, are as follows. See Table III.

Examination of this table enables us to make again the following statements for this subject with the method and arrangement described:

1. There is a tendency to error in the direction away from the larger square.

2. This tendency has so few exceptions that they are due probably to accidental causes.

3. The amount of this tendency is given in a number which fluctuates slightly about a value equal to .015 of the side of the larger square.

4. At the limiting value (0) of the side of the smaller square there is the same tendency to error, but it is less than $\frac{1}{2}$ the error when the ratio is 1 : 2.

5. The tendency to error is about 50 per cent greater when the stimulus for fixation is moving in the direction contrary to that of the variation itself than when it is moving in the same direction.

TABLE IV. — T. Fix. Method. Hor. Arrgt.

| No. Exps. | Ratio of Sides in in cm. | Mean Var. in mm. | | | Excpts. |
|---|---|---|---|---|---|
| | | Both Directions. | Right. | Left. | |
| 100 | 20 : 5 | 1.64 | 1.91 | 1.38 | 4 |
| 50 | 20 : 2.5 | 2.7 | 3. | 2.5 | 0 |
| 50 | 20 : 1.25 | 3.25 | 3.65 | 2.9 | 0 |
| 25 | 20 : 0 | 2.6 | 1.53 | 3.9 | 0 |

*IV. Results of T. Horizontal Arrangement.* — The experiments on T. with the horizontal arrangement, his method remaining as before that which I have called the "fixation method," gave the results shown in Table IV.

From the examination of this table we may make the following statement of results for T.:

1. There is a uniform tendency to error in the direction away from the larger square.

2. This tendency is from 1.64 to 3.25 mm., *i. e.*, in this case .008 to .016 the side of the larger square.

3. This tendency varies in some direct ratio with the ratio of the sides of the two squares to each other.

4. At the limiting value (0) of the side of the smaller square the tendency to error is the same as when the ratio between the sides of the two squares is $\frac{1}{8}$.

5. The tendency is about $\frac{1}{3}$ greater when the stimulus fixated is moving in the direction of the tendency to error (right) than when it is moving in the opposite direction (up).

TABLE V. — Sh. App. Method. Ver. Arrgt.

| | No. Rects. | Ratio of Sides in cm. | Reversals. | | | Supp'mentals. | | |
|---|---|---|---|---|---|---|---|---|
| | | | Movt. from S. | Movt. to S. | Total. | Movt. from S. | Movt. to S. | Total. |
| | 15 | 20 : 10 | 1 | 9 | 10 | 3 | 2 | 5 |
| | 14 | 20 : 5 | 1 | 7 | 8 | 5 | 1 | 6 |
| | 17 | 20 : 2.5 | 1 | 9 | 10 | 6 | 1 | 7 |
| | 33 | 20 : 1.25<br>20 : 0 | 5 | 18 | 23 | 6 | 4 | 10 |
| Totals | 79 | | 8 | 43 | 51 | 20 | 8 | 28 |

*V. Rectification Method.* — It is evident that a second series of indications may be obtained from the experiments given above in cases in which the reagent expresses his sense of the correctness or incorrectness of his result in each experiment. Both Sh. and T. were instructed to indicate after each experiment whether or not the bead gave a satisfactory result when stopped, and also in which direction the result should be rectified to give satisfaction. Records were kept of all such indications. Since it involved a secondary fixing of the mid-point, it approaches the "fixation" method; but since it followed upon the earlier determination made when the needle was in motion, it involves influences akin to those of the "approach" method; so it may be considered a combination of the earlier methods and a refinement upon both of them, for it requires a second act of judgment or criticism of the result already rendered in each trial. So let us call it the "rectification" method.

It is further apparent that this rectification of the result of any given experiment may take one of four phases. It may be a judgment that the needle has gone too far, this we may call rectification by "reversal;" or that it has not gone far enough, rectification by "supplementing." And each of these kinds of rectification will include again two instances. There will be reversals when the movement is in the direction of the prevailing error (*i. e.*, away from the larger square), and when the movement is contrary to the direction of the prevailing error (*i. e.*, toward the greater square). And the same two cases occur for the "supplemental" rectifications.

The cases of rectification in the experiments on Sh. and T., both of whom were instructed to use the method,

may be thrown into the following tables, in which the four kinds of rectification are distinguished.

*Results for Sh. Rectification of Results Secured by Approach Method. Vertical Arrangement.* — Giving the figures for Sh. in the vertical arrangement we have Table V.

From this table we may conclude as follows:

1. Of the rectification of results secured by the approach method, the "reversals" are nearly twice as frequent as the "supplementals."

2. The "reversals" are 5 times as frequent when the bead moves against the tendency to error as when it moves in the same direction.

3. The "supplementals" are $2\frac{1}{2}$ times as frequent when the bead moves in the direction of the error as when it moves in the contrary direction.

4. Rectifications take place in $\frac{1}{10}$ the entire number of experiments.

*Horizontal Arrangement.* — The rectifications of Sh. for the horizontal arrangement are shown in Table VI (first line).

TABLE VI. — Hor. Arrgt.

| Subject. | No. Rects. | Method. | Ratio of Sides in cm. | Reversals. | | | Supp'mentals. | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Movt. from S. | Movt. to S. | Total. | Movt. from S. | Movt. to S. | Total. |
| Sh. | 38 | App. | Whole series lumped. | 8 | 24 | 32 | 3 | 3 | 6 |
| T. | 25 | Fix. | " | 12 | 7 | 19 | 1 | 5 | 6 |

It results from this table:

1. The "reversals" number 5 times the "supplementals" among the rectifications of data derived by the approach method.

2. The "reversals" are 3 times as many when the bead moves in the direction contrary to the prevailing error (*i. e.*, toward the larger square), as when it moves in the opposite direction.

3. The supplementals are equally divided between the two cases of opposite movement of the bead.

4. The number of rectifications is about $\frac{1}{6}$ of the number of experiments.

*Results for T. Rectifications of Results Secured by the Fixation Method. Vertical Arrangement.* — The results of T. with the vertical arrangements appear in Table VII.

TABLE VII. — T. Fix. Method. Ver. Arrgt.

| | No. Rects. | Ratio of Sides in cm. | Reversals. | | | Supple'tals. | | |
|---|---|---|---|---|---|---|---|---|
| | | | Movt. from S. | Movt. to S. | Total. | Movt. from S. | Movt. to S. | Total. |
| | 10 | 20:10 | | | 0 | 7 | 3 | 10 |
| | 19 | 20:5 | 12 | 5 | 17 | 1 | 1 | 2 |
| | 19 | 20:2.5 | 3 | 1 | 4 | 6 | 9 | 15 |
| | 31 | 20:1.25<br>20:0 | 7 | 9 | 16 | 4 | 11 | 15 |
| Total . . | 79 | | 22 | 15 | 37 | 18 | 24 | 42 |

Table VII. shows the following:

1. Rectifications by "supplementing" are $\frac{1}{7}$ more fre-

quent than those by "reversal" when the results are secured by the fixation method.

2. The "reversals" are $\frac{1}{2}$ more frequent when the bead moves in the direction of error than when it moves in the contrary direction.

3. The "supplementals" are $\frac{1}{3}$ more frequent when the bead moves in the direction contrary to that of the prevailing error than when it moves in the same direction as the error.

4. The entire number of rectifications is $\frac{1}{9}$ of the entire number of experiments.

*Horizontal Arrangement.* — The rectifications of T. for the horizontal arrangement are given in Table VII (second line).

1. *Results.* — The "reversals" are three times the "supplementals" in the fixation method, horizontal arrangement.

2. The reversals are $\frac{1}{2}$ more when the bead moves in the direction of error than when it moves in the opposite direction.

3. The "supplementals" are five times more when the beads move contrary to the direction of error than when it moves in the same direction. This result, however, is based on too small a number of cases to be taken as a numerical ratio.

4. The number of rectifications is $\frac{1}{9}$ of the whole number of experiments.

*VI. General Interpretation of Results.* — We are now able to gather up the results shown in the earlier tables in some more comprehensive statements, based upon the whole number of experiments taken together.

I. Considering the results for the direction and amount of error without regarding the influence of the direction of movement of the light-bead, we may plot curves

showing the tendency and amount of error for each of the two arrangements by each of the two methods. In Fig. 2 the horizontal ordinate represents the constant series of ratios of the square sides to each other; the vertical ordinate, the size of the error and its duration (above the abscissa denoting error away from the larger square). Curves (1) and (2) give the results by the approach method, vertical and horizontal arrangements respectively; curves (3) and (4) the results by the fixa-

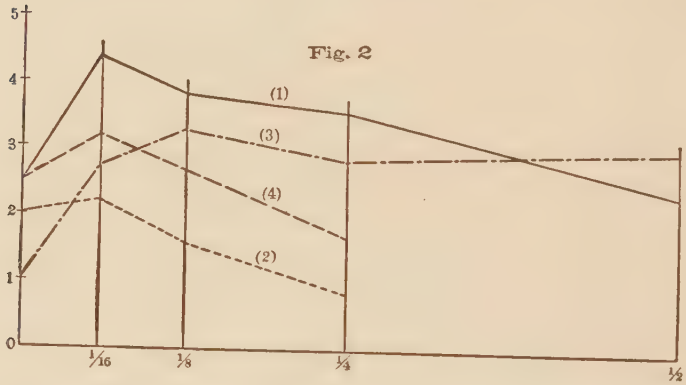



Fig. 2

tion method, vertical and horizontal respectively. The location of the various points of the curves is determined in each instance by the figures given in the appropriate table above. The curves are numbered to correspond with the respective tables.

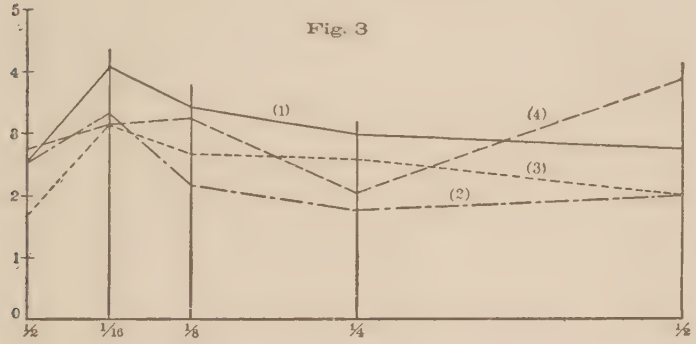
Inspection of the four curves gives certain general results which unite and summarize the results already shown from the separate tables above.

1. The four curves (representing 1,928 experiments) agree in establishing a tendency to error away from the larger square of from 1 to 4.5 mm. when the side of the larger square is 20 cm.

2. The close parallelism of three of the curves in their common direction, and the general parallelism of all the four, establishes the fact that the tendency to error increases with the relative increase of the side of the larger square.

3. The position of curves (1) and (3), considered in relation to the position of curves (2) and (4), shows that the tendency to error, when the squares are ar-

Fig. 3




ranged vertically, is about twice as great as when they are arranged horizontally.

4. Comparison of curves (1) and (2) with curves (3) and (4) shows that the method of fixation gives more uniform results than the method of approach; and also that the difference in results between the vertical and horizontal arrangements is less when the fixation method is used. It follows from this that eye-movements over a line hinder the correct estimate of the parts of that line, and that this influence of eye-movement is greater for vertical than for horizontal directions.

II. Considering the results with regard to the direction of movement of the light-bead by both methods and in both arrangements, we may plot the curves of Fig. 3,

in which the ordinates remain as in Fig. 2, the points on curves (1) and (2) give the amount of error for the several contrast ratios for the case of movements of the bead away from and toward the larger square respectively by the approach method, and the points on curves (3) and (4) give the amount of error for the same two cases respectively, by the fixation method. These amounts are reached by combining the figures for "down" and "right" movements in the tables of vertical and horizontal arrangements of the approach method, for each contrast ratio, and combining similarly the "up" and "left" results of the corresponding tables of the fixation method.

Inspection of these four curves (again representing the entire 1,928 experiments) leads us to certain conclusions.

1. Comparisons of curves (1) and (3) with curves (2) and (4) shows that the error is greater when the bead is moving in the direction of the error.

2. This is especially the case when the approach method is adopted, the error then being twice as great when the movement is in the direction of the normal error as when it is in the contrary direction: comparisons of curves (1) and (2).

3. It follows that the influence already found to be due to eye-movements varies according to the particular direction of the movement along the line explored. If the eye-movement is toward the larger of the areas contrasted, it tends to correct the normal error of judgment in the estimation of the line which connects the two areas. If the movement is, on the contrary, away from the greater area, it exaggerates the normal error of judgment.

III. The details of the instances of "rectification" given above serve to confirm these general conclusions,

both as to the normal error itself and as to the influence of eye-movements upon it. By the approach method the rectifications by reversal are two to five times more frequent than those by supplementing. This shows that the rectifications in this instance are really corrections of the influences now found to be due to eye-movements. Further, reversals are three to four times as frequent when the bead moves against the tendency to error as when it moves in the direction of this tendency. This shows that these corrections are much more likely in direction opposite to that in which we now find the real contrast error to occur. When moving in the direction of the contrast error the eye-movement influence gets support from that error, and so fails of detection, and even secures supplementing in this direction more frequently than the movement in the opposite direction does. This is an indirect determination of the true direction of the contrast error in agreement with the direct experimental result.

The rectifications in the fixation method, on the other hand, are equally divided between the "reversals" and the "supplementals," showing that the influence of eye-movement is largely eliminated by this method. And further, the distribution of both supplementals and reversals between the two cases of movement, in one direction or the other, is now directly reversed, *i. e.*, the reversals are more frequent when the bead moves in the direction of error, and the supplementals when it moves contrary to this direction, a result which seems to show that in this case the tendency to error from contrast is in conflict with the normal influence of eye-movements, and the correction is made to increase the latter in one direction, and to diminish the former (or their sum) in the other direction.

The entire number of rectifications of all kinds (about $\frac{1}{9}$ of the whole number of experiments) may be taken as a sort of quantitative indication of the function of second-judgment, or deliberation, upon sensory determinations of such a complex character as those involved in these experiments. It is interesting to note that this second judgment, however, does not tend in the general result to correct the error of first judgment; for there are about $\frac{1}{2}$ more cases of rectifications by displacement toward $S^1$ (the direction of the error) than toward S. The only case in which the correction does work to give greater accuracy to the result is that of the use of the fixation method, where both the original and second judgments are comparatively free from eye-movements and their after effects.

Finally, the great uniformity of the error of judgment is seen in the small number of cases (69 in the entire series of 1,928 experiments) in which the mid-point was located in the direction opposite to the prevailing error (that is, located too far toward the large square). And even this number represents too high a figure, since the sum of the variations of this kind in all but two series gave only 28 cases (*i. e.*, in 1,679 experiments); the two giving the very abnormally large figures 20 in 100 experiments (app. method, horiz. arrangement) and 21 in 149 experiments (fix. method, vert. arrangement) being evidently affected by some temporary influences.

A series of experiments has already been begun with a stationary stimulus (thus ruling out the influence of eye-movements)[1]; and I hope also to complicate the case with variations planned to introduce æsthetic elements into the problem.

[1] See the next paper.

# XV

## AN OPTICAL ILLUSION[1]

I REPRODUCE, in one of the accompanying diagrams (A), the arrangement used in a research published in *The Psychological Review* (II., May, 1895, p. 244),[2] the result of which was to show that the judgment, *i. e.*, of the midpoint between two such squares as those of Figure A, is subject to illusion. The actual midpoint, marked by the short bar on the line of connection between the squares, is regularly judged to be too far toward the smaller. I should like to gather further results by the use of the Figures A and B, and your readers may be willing to assist as follows:

Ask people of both sexes, but recording the difference of sex, the following questions strictly in the order named, first of Figure A. They should be entirely ignorant of the experiment and its results.

Question 1. Holding the figure before the eyes with *the bottom of the page down*, is the line connecting the squares bisected by the short line or not, and if not, is the real midpoint further to the right (R) or to the left (L)?

Question 2. Holding the page with *the bottom of it turned to the right hand*, ask whether the midpoint is

[1] From *Science*, November 27, 1896.

[2] See the preceding paper.

marked by the line or whether it is farther up (U) or farther down (D).

Question 3. Holding the figure with *the bottom of the page upwards*, ask as in question 1.

Question 4. Holding the figure with *the bottom of the page toward the left hand*, ask as in question 2.

Then taking Figure B, ask *the same questions in*

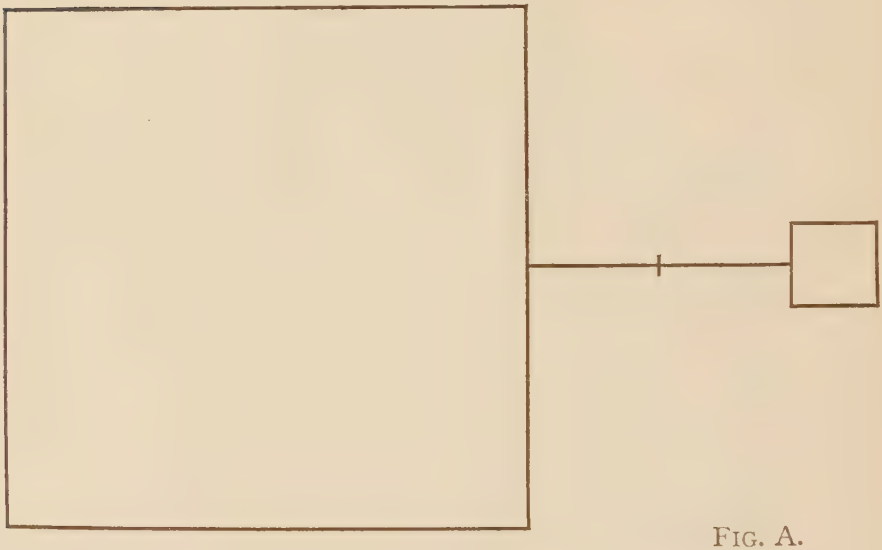


FIG. A.

*the same order*, being careful to have the person still altogether uninstructed as to the results of the first series and also to connect the two series, carefully distinguished, with the same person by name or initials.

When using one figure, *the other should be covered.*

The results, whether from one person or from many, may be sent to the undersigned, who will receive them with thanks. Results from those who know what the illusion is and what to expect need not be sent, *except*

*in cases of persons who do not get the illusion at all, or who only get it for one of the figures.*

Any known defects of eye-sight should be reported; also indications of tastes or pursuits, as of architects, artists, etc., likely to modify the results.

I should also be glad to be referred to any literature which seems to touch upon this illusion.

FIG. B.

The interest of this method of investigating the illusion is that it exactly reverses the conditions of the research reported in the preceding paper. There the midpoint was determined by the reagent, and was placed too far toward the smaller square. If this be a true illusion, it was argued, the actual middle should be judged too far toward the smaller square. This was fully proved to be the case by the replies which came

in by hundreds. The following summary report of these and other results not yet published in detail is from the *Proceedings of the American Psychological Association*, December, 1897:[1]

An Optical Illusion. — This report gave the result of further experiments of the "Illusion" reported above, *i. e.*, that the point fixed upon as the midpoint between two square areas is located too far toward the smaller area, the amount of the displacement increasing with the ratio of the larger to the smaller square side. The following new results are reported: 1. The earlier results are confirmed on additional observers. 2. The illusion holds, though much lessened in amount and with some exceptions, for the determination of the midpoint between two parallel lines of different lengths. 3. The illusion requires a figure of certain — not exactly determined — maximum size, *i. e.*, the illusion does not appear when the eyes of the observer are too near, but appears when he retires backward from the figure.

The author also reports having established the reverse illusion, *i. e.*, the misjudgment of the midpoint when actually marked, in the figure just described. It is held to lie *too far toward the larger square.* This result is completely established by returns in a great many answers to a request printed in *Science* (November 27, 1896) with an accompanying figure, — principally returns from students collected by teachers of psychology and science.

The author intends to investigate the effect upon the illusion of variation in the distance between the areas, and also to test various explanations of it. He has already found that the element of "perspective" has probably little influence on it;[2] also that the principle of "equilib-

[1] See *The Psychological Review*, March, 1898, p. 166. A more popular exposition with discussion of the possible applications of the illusion in architecture, etc., is given in my *Story of the Mind*, chap. vi., iii.

[2] This is reversed by later experiment; it is probable that "perspective" enters largely into the case. See further below (and Figure D).

rium" does not account for it, seeing that (a) the illusion is contrary in its direction to that which this principle would produce, and that (b) it holds under conditions which exclude the operation of this principle. The fact of this reverse illusion establishes the point made in the original paper, that the experimental conditions — involving the following of a light-bead along the line — were, under the control methods employed, entirely adequate, and so meets the criticisms of Binet and Witasek. Certain æsthetic applications of the illusion will be indicated in the detailed paper.

Variations of this illusion are shown in Plate C, Figures 1–5[1] in each of which the short upright bar is the central point, and is seen somewhat displaced toward the larger masses or longer lines on one side. Of special interest is Figure 5 (Plate C) which shows the same deviation when one figure is inside the other.

Of the general explanations, that of contrast (which means only that sizes, distances, and positions in the field of vision are judged relatively to one another, whatever we may discover to be the more special reason for it in particular cases) has been invoked; indeed it was to study visual contrast that the experiments given in the preceding paper were first devised.[2] It has been made probable, however, especially by Thiéry, that an element of perspective enters into many geometrical illusions — *i. e.*, the viewing of a figure *as if* part of it extended back from the plane of the paper, an arrange-

[1] After Judd: see his important paper, *Psychological Review*, May, 1899, pp. 241 ff. From here on the text, and also Figs. D and E, are now first published.

[2] It is also so classed by Sanford, *Course in Experimental Psychology*, experiment 197. See Sanford's article "Optical Illusions," in the writer's *Dictionary of Philosophy and Psychology*, for a general treatment of the subjects, with many figures and citations of literature.

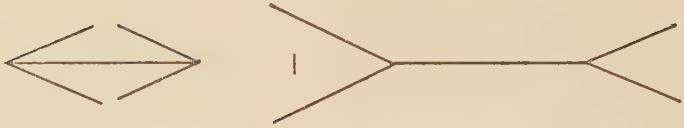


FIG. 1.

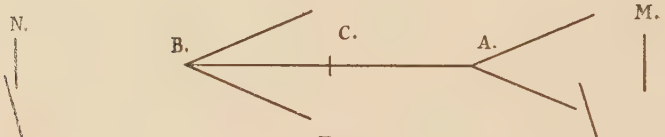



FIG. 2.

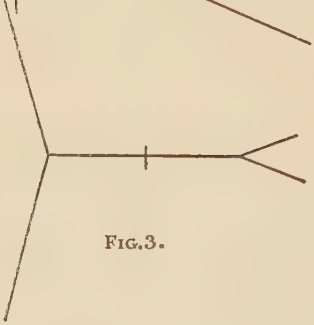


FIG. 3.

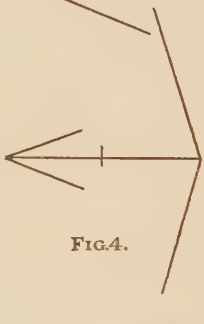


FIG. 4.

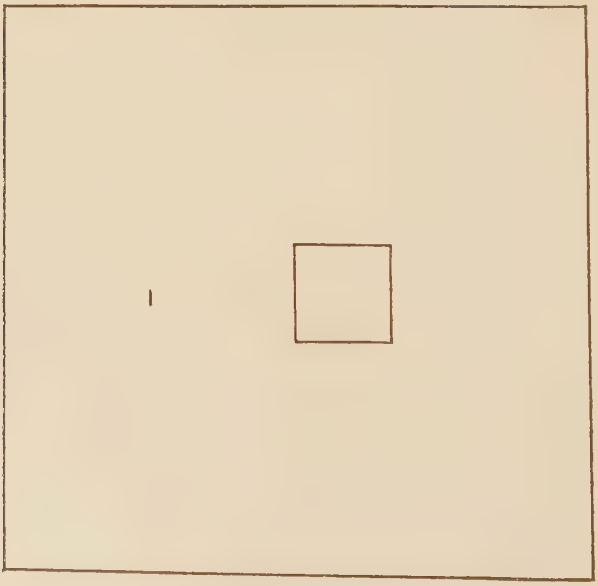


FIG. 5.

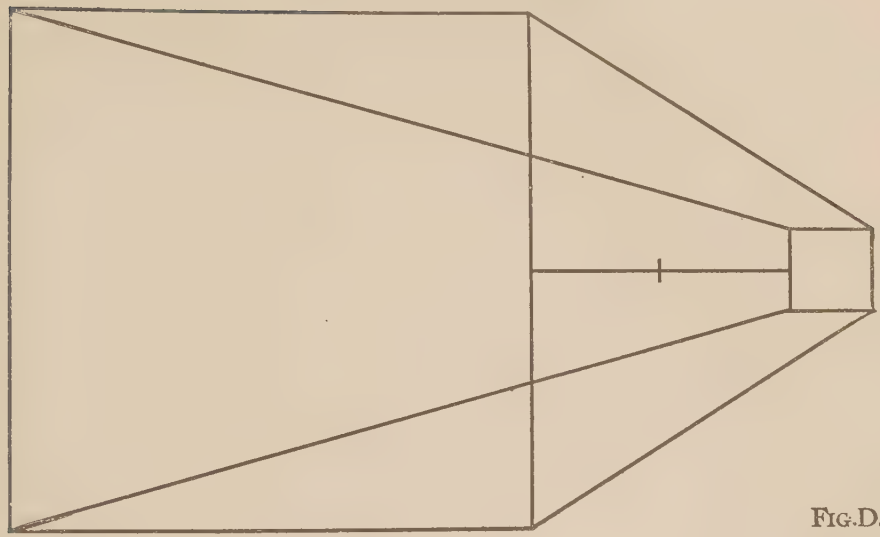


FIG. D.

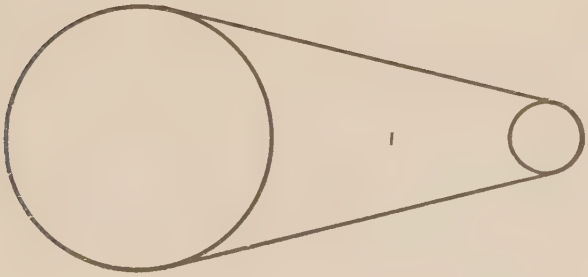


FIG. E.

ment in which the distant object is normally smaller and the line of distance or perspective is foreshortened. This influence probably enters in this case: as may be seen by viewing Fig. D in the two possible perspectives. First bring up the large square by focussing it as nearer and view the smaller one as more distant — the whole making a tunnel opening having its large end towards the observer. In this case the illusion is exaggerated; the bar seems still nearer the large end of the tunnel. This would mean that the normal illusion is due to our tendency to view the figure — and similar figures, such as the two concentric circles or squares — as representing a solid object extending backward. If, however, we reverse our visual accommodation so as to make the figure a truncated pyramid lying on its side with the small end toward the observer (the large square above thus being beyond the plane of the paper), the illusion tends to disappear. This comes out better, if after practising on Fig. D, in which the corners are connected by lines to favor the projection, the same be tried with Figure 5, Plate C, in which the bar falls on the plane of one side of the pyramid.[1] Similarly the other figures of Plate C may be viewed as solid objects standing on one end or the other with corresponding effect upon the illusion.[2] See also Fig. E.

[1] The writer has been interested, since knowing of this illusion, in reproducing the conditions of judging such a midpoint in actual perspective. The conditions were admirably fulfilled in looking down from the hill-top upon the funicular railway at Marseilles. The two cars in their passage in contrary directions balance each other and meet precisely at the half-way distance. The point at which they meet seems, however, to the observer at the top to be much too far toward the lower end of the road.

[2] The matter is a difficult one to experiment on, seeing that individuals vary so much, both in their natural tendencies to see in perspective, and also in their ability to shift from one accommodation to another.

# XVI

## NEW QUESTIONS IN MENTAL CHRONOMETRY[1]

In view of an article in the *Medical Record* for March 4, 1893, it may be of interest to its readers to have a further note on the subject of the "Psychology of Reaction-time." The distinction between "sensory" and "muscular" reaction was first made public by Lange,[2] working under Wundt; and it seemed from his results, and others immediately following him,[3] that the distinction was sound. Indeed it appears reasonable from the point of view of general psychological theory. All we know of the attention, as well as what we know of the relation of attention to voluntary movement, makes it seem likely that a reaction would be shorter if the attention be concentrated beforehand on the proposed movement (muscular or motor reaction), than if it be concentrated on the signal to which the subject is instructed to react (sensory reaction).[4] Recent researches, however, have given results which have tended to make a reconsideration of the question necessary; indeed some experiments have been so negative that certain investigators are disposed to throw over the distinction altogether.[5]

I am sure that this would be to go too far. I have en-

[1] From the *Medical Record* (N. Y.), April 15, 1893.
[2] *Philosophische Studien*, iv., p. 479.
[3] Martius, *ibid.*, vi., p. 167; Titchener, *ibid.*, viii., p. 138.
[4] This is the distinction in question.
[5] Cattell, *Philosophische Studien*, viii., p. 403.

deavored incidentally, in an article now in print for the July issue of the *Philosophical Review*,[1] to account for the conflicting results of experiment in this field by borrowing from the medical psychologists the results of their brilliant analysis of the speech function, on the basis of its pathology. The recognition of the great forms of aphasia — *i. e.*, sensory and motor — and the corresponding recognition of the existence of visual, auditory, and motor speech types, gives a strong presumption that the distinction between sensory and motor in the voluntary movements of speech and writing applies as well to voluntary movements of all kinds; that is, to all movements which have been learned by attention and effort. This means that a man is an "auditive," or a "visual," or a "motor" in his voluntary movements generally. His attention is trained by habit, education, etc., more upon one class of images than upon others, his mind fills up more easily with images of this class, and his mental processes and voluntary reactions proceed by preference along these channels of easiest function.

If this be true it is evident that a man's reaction-time will show the influence of his memory type. The motor-reaction we should expect to be most abbreviated in the man of the motor-type; and less abbreviated, or not so at all, in the "visual" or "auditory" man. And experimental results must perforce show extraordinary variations as long as these typical varieties are not taken account of. We are accordingly, I think, a long way off from any such exact statement of absolute difference between sensory and motor reaction-time as Wundt makes in his last edition.[2]

[1] Article entitled "Internal Speech and Song," *Phil. Rev.*, July, 1892 (chap. xiv. of *Mental Development*).

[2] *Physiologische Psychologie*, 3d ed., ii., pp. 261 ff.

The position is in direct accord with Pick's[1] interesting argument for the central seat of the motor disturbances which result, in certain cases of anæsthesia, from the closure of the eyes. It is really the attention which is disturbed in these cases, through the loss of its usual support from the sense of sight; it is not a loss of "muscle sense" only.

In addition — and this I wish to bring to the attention of the medical men who busy themselves with aphasia — the indications of memory "type" afforded by reaction-times ought to support the analysis of speech from aphasic cases (that is, when we psychologists have gone as far on our side as the physicians have on theirs!). A man with a relatively short "sensory reaction" would be of the sensory type, and would be peculiarly liable to sensory forms of aphasia — loss of speech through word-blindness, word-deafness, etc., and to paraphasia and paragraphia. On the other hand, one whose "motor" reaction-time is very short, would be liable to loss of speech from interference with his muscular memories. For example, I think it is likely that patients like those of Grashey, Bastian, Charcot, and others, who could read or speak only by tracing the letters with the hand, were probably of the motor type and would have given relatively short motor reactions. I am not sure that such a correspondence could be made out in actual cases of aphasia, but it is an interesting deduction, and possibly medical men may find opportunity of testing it with the aid of a portable instrument such as the *chronomètre d'Arsonval.*

In my laboratory a research is now nearing completion which has given experimental ground for this main position. I have three practised reaction-time subjects who

[1] *Zeitschrift für Psychologie,* etc., iv., pp. 261 ff.

illustrate three distinct types. In one, the motor (hand) reaction is shorter than the sensory (hearing); in the second, the two kinds are about equal; while in the third (a musician), the sensory is about one-quarter shorter than the motor.[1] I hope, before publishing the results in detail, to bring other tests to bear for the determination of the relative influence of sight, sound, and muscle-sense respectively in the reactions of the different types. One of these tests has gone far enough, however, to enable me to make a further distinction in the character of motor reactions, *i. e.*, between what may be called visual motor reaction (motor attention with sight of the organ employed to react — involving the *optische Bewegungsbilde* of the Germans) and kinæsthetic motor reaction (motor attention without sight of the reacting organ). In my experiments, so far, the "visual motor" reaction is shorter than the "kinæsthetic motor," except in subjects of the extreme motor type; in these latter the "kinæsthetic motor" is shorter, the visual motor-time approximating the sensory reaction-time. This research was suggested by the cases already referred to of loss of voluntary movement through closure of the eyes, taken with the further observation that even though the eyes are open in these cases, voluntary movement is still impossible until the gaze of the patient be directed to the particular limb in question. The distinction between "visual motor" and "kinæsthetic motor" reaction-time has interest, I think, from other points of view as well.[2]

[1] Cattell reports a similar case, *loc. cit.*, p. 406.

[2] See the next paper for the full report of this research.

# XVII

## TYPES OF REACTION[1]

THE experiments reported in this paper were carried out in the University of Toronto in 1892–93. Three questions were set for research, all of them bearing on the question of the degree of relativity of reaction-times: as to the difference of a single individual's times, according as there were subjective (attention) or objective (qualitative stimulus) changes in the conditions of his reaction; or as to differences of reaction-times for different individuals under identical conditions. To secure results comparable in the respects in which comparisons were desired, certain precautions were made, as follows: (1) each reagent reacted at the same hour from day to day, and at the same hour with each other reagent whose reaction was to be compared with his; (2) the order of change in the conditions of reaction (as sensory-motor, light-dark, visual-kinæsthetic, etc.) was kept in the main the same for the different reagents.

The Hipp and D'Arsonval chronoscopes were used, both controlled by the records of a König tuning-fork recording on the drum of the Marey motor. The "light" reactions were taken in a room of good south morning exposure, and those in the dark, in a dark closet of the same room. The stimulus was in all cases an auditory one — a sharp metallic click — and the re-

[1] With the assistance of W. J. Shaw. From *The Psychological Review*, May, 1895.

acting movement was a pressure downward of the right forefinger (in the case of the D'Arsonval instrument, a pinch of that finger and the thumb). The reagents were, besides the writers (B. and S.), Mr. Faircloth (F.), a student who had had only the experience gained from the practical work in this subject of the course in experimental psychology. His reactions were ready and unconfused, and from all appearances he was a normal and more than usually suitable man for such work. The fourth, Mr. Crawford (C.), is an honor student in this subject in Princeton. His reactions were taken in the course of another investigation, and being so few in number, they are included only because they indicate a case of a capable reagent whose sensory is shorter than his motor reaction. We hope to test him further.

I. *Variations in the Results.* — Table I shows the relative reliability of the two instruments in these experiments.

TABLE I. — Clock-corrections.

| Instrument. | Const. Error. sec. | Var. Error. sec. |
|---|---|---|
| D'Ars., | .19 | .0622 |
| Hipp, | .019 | .0156 |

All the results secured by each instrument are corrected by the constant error of that instrument, before being used either for comparison among themselves or for compounding with the results of the other instrument, in the tables which follow. The smaller variable error of the Hipp chronoscope makes the results of that instrument much more reliable in the matter of absolute

time-measurement. But in the conclusions drawn below, only those results are used in which the quantity sought is a relative one, and in which the two clocks confirmed each other in giving ratios of difference of the two quantities compared, both of which are in the same sense, and each of which is larger than the largest possible ratio of difference arising from the variable error of the clock to which it belongs.

The mean variations are not given in the tables which follow, because they are too complex to be of any value. These variations were different for the two clocks, as we should expect from the variable errors of the instruments themselves; they also varied with the disposition of the subject in the various groups of results which are treated together.[1] The different mean variations for the different lots of experiments varied from 10 $\sigma$ to 20 $\sigma$ ($\sigma = .001$ sec.). For this reason no deductions are attempted except those evident on the surface of the results themselves.

TABLE II. — Types of Reaction.

| Subject. | No. Exps. | Sensory. | | Kin. Motor. | | Vis. Motor. | | Av. Motor. | |
|---|---|---|---|---|---|---|---|---|---|
| | | No. | Time in $\sigma$. | No. | Time in $\sigma$. | No. | Time in $\sigma$. | No. | Time. |
| B. | 2490 | 1043 | 178 | 966 | 149 | 481 | 171 | | 160 |
| S. | 2572 | 1017 | 235 | 995 | 184 | 560 | 195 | | 187 |
| F. | 820 | 290 | 164 | 260 | 202.3 | 270 | 205.5 | | 204 |
| C. | 212 | 84 | 132 | | | | | 128 | 157 |

[1] Finer distinctions were aimed at in some of the series, such as placing the sound stimulus on one side only, or in the median plane below the head, etc., as well as arranging for the difference between light and dark environment.

II. *Results: Sensory and Motor Reactions.* — Table II gives the results of experiments on four persons designed to test the current distinction between "sensory" and motor ("muscular") reactions.

It follows from Table II: (1) that the current distinction between sensory and motor reactions does not hold in the sense that the motor reaction is always shorter than the sensory, for in the case of F. the motor reaction is 40 $\sigma$ longer, *i. e.*, $\frac{1}{3}$ of this subject's average sensory reaction time. (2) As between B. and S., in the case of each of whom the motor-time is shorter, there is a great difference in the relative length of the sensory to the motor. In B. the sensory time is only 18 $\sigma$, or about $\frac{1}{9}$ longer than the motor, while in the case of S. the sensory is 48 $\sigma$ longer, or about $\frac{1}{4}$; and this despite the close agreement of the two subjects in their absolute motor-time. We would seem to have, therefore, in these three observers three cases shown, two giving very pronounced results; one a longer motor-time by $\frac{1}{3}$, and the other a longer sensory by $\frac{1}{3}$. The third subject, B., seems to fall between these extremes, giving a difference in favor of the motor reaction, it is true, but a much smaller difference.

The tables also give us reason for accepting the truth of the distinction between two kinds of motor reaction. In both B. and S., whose motor reactions are shorter than the sensory, we find a difference in the length of the motor reaction according as the attention is given to the movement by thought of the hand, the eyes being blindfolded, or as the attention is fixed upon the hand, which is seen. The former I have called the *kinæsthetic motor* reaction, the latter the *visual motor*. In B. the visual motor is 22 $\sigma$, or about $\frac{1}{7}$ longer than the "kinæsthetic" — that is, it is practically equal to this subject's

sensory time; while in S. the kinæsthetic motor is 11 $\sigma$ shorter than the "visual." With F., on the contrary, there is no distinction between the two kinds, any possible trace of it seeming to be lost in the excessive preponderance, in facility, of the sensory kind of reaction.

The table as a whole, then, supports the views: (1) when the motor reaction is short in relation to the sensory (case of S.), then this motor reaction is purest, freest from sensory influences, such as sight, etc.; (2) when the motor reaction is not pure, then it is retarded by such influences as sight (case of B.); (3) where the motor reaction is relatively difficult and delayed, as compared with the sensory (case of F.), there this prime difference renders all kinds of motor reactions equally lengthy and hesitating. B. seems to stand midway between the two others in this respect.

As I said some time ago, in making a first report upon the outcome of some of these experiments:[1] "In subjects of the motor type the 'kinæsthetic motor' is shorter, the 'visual motor' time approximating the sensory reaction time."

III. *Light and Dark Reactions to Sound.* — The foregoing deductions concerning the difference between B. and S., as respects motor and sensory reactions, and also as respects the distinction between visual and kinæsthetic motor reactions, are confirmed by results of a research on the same two subjects, in which the attempt was made to investigate the influence of vision. Each reagent gave a series of reactions in the light of an ordinary laboratory room, and then repeated the series under the same general conditions, but in a dark chamber. In this case, in order to make the results of the two series comparable, the kinæsthetic form of motor

[1] New York *Medical Record*, April 15, 1893, pp. 455 f. (see above, p. 286).

reaction was necessary in the series taken in the light, since only that kind of motor reaction was possible in the dark. The results are given in Table III.

TABLE III. — Reactions in Light and Dark.

| Subject. | Light. | | | | Dark. | | | |
|---|---|---|---|---|---|---|---|---|
| | Sensory. | | Motor. | | Sensory. | | Motor. | |
| | No. | Av. in $\sigma$. | No. | Av. in $\sigma$. | No. | Av. in $\sigma$. | No. | Av. in $\sigma$. |
| B. | 541 | 176 | 979 | 164 | 502 | 184 | 468 | 138 |
| S. | 537 | 237 | 1190 | 158 | 480 | 219 | 469 | 179 |

On examination the results of this table, compared with those of the preceding table, may be stated as follows: We find for B. that the sensory reaction is practically the same, whether he react in the dark or in the light (the latter is less by 8 $\sigma$, which is insignificant in view of the variable error). This shows this subject's independence of vision in the sensory reaction to auditory stimulations, and is in agreement with the results of Table II (in which there is a similar difference between the sensory and visual motor, the former being longer by 7 $\sigma$). S., on the other hand, shows a shortening of the sensory reaction when in the dark by 18 $\sigma$, but a lengthening of the motor reaction when in the dark by 21 $\sigma$, or about $\frac{1}{7}$. The latter result shows this subject's dependence upon vision only in the motor kind of reaction.[1]

[1] The "dark reaction" was not secured from F., the "sensory" subject; but we hope to report further results obtained from C., the similar case found later at Princeton.

IV. *Interpretation.* — Admitting that these results indicate clearly the existence of persons whose sensory reactions to sound are shorter than their motor reactions, and that there are in some individuals differences in the length of the motor reaction, according as it is made in the light or in the dark, we may make some general remarks on the theory of these differences.

These results should be compared with earlier ones, a matter which is made easier by reference to the concise summing up of the literature of the subject by Titchener in *Mind*.[1] We find cases of relatively shorter sensory times similar to mine reported (for electrical stimulus) by Cattell,[2] and (for sound stimulus) by Flournoy.[3] We may accordingly say that such individual differences are clearly established, and must hereafter be acknowledged and accounted for in any adequate theory of reaction.

The attempt of Wundt, Külpe, and others to rule these results out, on the ground of incompetency in the reagents, is in my opinion a flagrant *argumentum in circulo*. Their contention is that a certain mental *Anlage* or aptitude is necessary in order to experimentation on reaction-times. And when we ask what the *Anlage* is,

[1] January, 1895, p. 74.

[2] *Philos. Studien*, viii., 403.

[3] *Arch. des Sci. Phy. et Nat.*, xxvii., p. 575, and xxviii., 319. Titchener, in his summing up, does not cite the cases of Flournoy nor the earlier report of one of my present cases (F.) in the *Medical Record*, April 15, 1893, although they tell directly against his own views. My earliest case was noted by me in the autumn of 1892, and the note in the *Medical Record* was written in December, 1892, before I saw either Cattell's or Flournoy's articles. The sentences quoted from my *Senses and Intellect* by Titchener in *Mind*, *loc. cit.*, were based upon my own reaction-times, taken earlier when I had no reason to doubt the universality of the experience, as claimed by Lange and Wundt. Titchener is accordingly wrong in citing me as favoring their position.

we are told that the only indication of it is the ability of the reagent to turn out reactions which give the distinction between motor and sensory time, which Wundt and his followers consider the proper one. In other words, only certain cases prove their result, and these cases are selected because they prove that result. It is easy to see that this manner of procedure is subversive both of scientific method and of safely-acquired results in individual psychology. For the question comes: what of these very differences of individual *Anlage?* How did they arise? — what do they mean? — why do they give different reaction-time results? To neglect these questions, and rule out all *Anlagen* but one, is to get the psychology of some individuals and force it upon others, and thus to make the reaction-method of investigation simply the handmaid to dogma.

The attempts to explain the relative shortness of the "muscular" reaction, also, by those who hold its shortness to be a universal fact, have been unfortunate. It has been held that the muscular reaction is shorter because it is semi-automatic; the thought of a movement, *i. e.*, attention to it, being already the beginning of the innervation necessary to its production. This is very true as a principle, I think; but it is just the application of this principle which makes it necessary on the part of some to restrict reaction work to people of a special aptitude. For in all those cases, either of particular reactions in one individual or of all reactions in other individuals, in which the movement is not so clearly picturable as to be firmly and steadily held in the attention, to these cases the principle does not apply. On the contrary, to all cases where it is difficult to get the attention fixed upon a *motor* representative of the movement, a very different principle applies, as others have

remarked. The very attempt to picture a movement *as a movement* — by putting the attention on its *motor* aspect in consciousness — embarrasses, confuses, and delays the execution of that movement in these cases. If a marksman attend to his finger on the trigger he misses the target; if a ball-player attend to his hands he "muffs" the ball; if a musician think of each finger-movement he breaks down. The musician in the laboratory is usually, indeed, a glaring instance of unsuitable *Anlage!*

So it is evident that these two principles need reconciling in their application to reaction-times, the principles, *i. e.*, (1) *that the thought of a movement already begins it, facilitates it, quickens it;* and (2) *that attention to a practised movement, in many instances, embarrasses it, hinders it, lengthens it.*

Now the practical reconciliation of just these two principles has been made in another great department of fact, and the plotting of the cerebral arrangements which underlie them worked out — a solution which has such evident application here that I wonder at its tardy appreciation. I refer to the work in the pathology of aphasia, and the general theory of mental "types" which now goes for a safe discovery in the discussions of "internal speech," "sensory *vs.* motor defects" of speech, etc. I published early in 1893 the hypothesis to account for the variations in this matter of reaction-time differences now printed in the preceding paper.

It was a sense of the great naturalness and probability of this hypothesis that led, early in the fall of 1892, to the experiments on "visual" and "kinæsthetic" motor reactions whose results are given above in this paper.[1]

[1] At the Philadelphia meeting of the American Psychological Association, on Dec. 28, 1892, I proposed the hypothesis informally. I venture

The secure establishing of cases which show sensory reactions shorter than motor (*i. e.*, the cases now reported by Cattell, Flournoy, and myself), together with the probable distinction between the "visual" and "kinæsthetic" forms of motor time, make it advisable that this hypothesis should be put in clearer evidence. I shall therefore proceed to state the case for it briefly on the basis of the facts as they are now known.

The doctrine of "types" rests upon certain facts which may be briefly summed up. A voluntary motor performance — say speech — depends in each particular exercise of it, upon the possibility of getting clearly in mind (*intérieur*, *innerlich*) some mental picture, image, presentation, which has come to stand for or represent the particular movements involved. This mental "cue" or representative may belong to either of two great classes: it may be a "sensory" cue or a "motor" cue. People are of the sensory type or of the motor type for speech according as their cue in speech is sensory or motor; that is, according as in speaking they think of the sounds of the words as heard, the look of the words as written, etc., — the cues furnished by the special senses associated habitually with speech — this on the one hand; or according as, on the other hand, they think of or have in mind the movements of the vocal organs, lips, tongue, etc., involved in speech. In the "motor" people there are incipient movements in mind; in the "sensory" people there are special sense images in

to make these personal explanations since a somewhat similar explanation of his cases was advanced by Professor Flournoy, of Geneva, in the articles cited above. I was not acquainted with Professor Flournoy's views, until, a year later at the New York meeting of the Association, they were brought to my attention, as given in abstracts in the *Revue Philosophique* and the *Zeit. für Psych.* I return to Professor Flournoy's position later on in this paper.

mind. All this is now so clear from the pathological cases examined that the theory of localization of brain areas and their connections is applied to the successful exploration of damages of the brain when aphasic symptoms furnish the main diagnostic resource.

Now, let us see how in these cases of aphasia the two principles spoken of are applied. Suppose we agree with the neurologists in saying that the function of the "cue" — the mental image, be it either motor or sensory, which when thought of enables a man to speak — is to release energy from its own brain-seat, along association fibres or pathways, to the motor-seat which sends its discharges out to bring about the movement. Then the difference between sensory and motor people is simply that different centres — different "cue"-seats — have these connections with the motor speech centres best or better developed. A man who speaks best when he thinks of the sounds of the words has his best "cue"-seat in the auditory centre; and his best pathway to the the speech motor-centre goes out from this "cue"-seat. In the case of the man who speaks best when he thinks of the utterance of words, the same may be said of the muscle-sense seat.

So it is evident — quite apart from the question as to how one or other state of things comes to be as it is in any one case — that with one man attention is directed to the *movement* for the best results, with another to the sensation or special memory image in close association with the movement. With the former *the thought of the movement begins the movement.* But with the other, if the best doing of the movement comes from thinking of a sensation or special image, *then the movement will be relatively deranged, embarrassed, when the attention is drawn from this sensation* and forced to fix itself upon

the movement itself. These, then, are the two principles we desiderate, and they are both natural parts of the "type" theory.

So why not generalize this? Speech cannot be considered an exceptional function in its rise and mechanism. Other complex motor functions show the same kinds or types of execution: handwriting, music-performing, etc.[1] The hand has, next possibly to the tongue, the most delicate, varied, and differentiated functions to perform; and the laws of association by which sensory cues, checks, controls, are affixed to hand actions and combinations, must be the same as those involved in speech. So in simple hand movements people must show the sensory and motor types. This is my hypothesis.

The man, therefore, who gives relatively shorter motor reactions is a "motor" in his type; with him the thought of movement is the most facile beginning of the movement, just because it is *really the movement*, and nothing else, that he thinks of. That is his *Anlage*. But the man who gives relatively shorter sensory (auditory, visual) reactions is a "sensory" in his type; with him the attempt to think of the movement *as a movement* interferes with the prompt and exact execution of it, just because he is not accustomed to execute his movements in that way. That is his *Anlage*. But, of course, the two sorts of people have equal claim to recognition in science. Suppose a dead aphasic brought for autopsy to a surgeon, who inquires into the life-history of the man, and finding that he was of the sensory type, then declares that the body is not fit for

[1] See my *Mental Development*, pp. 91 ff., and 438 ff. In chap. xiv. of that work, on "The Mechanism of Revival," I have endeavored to put in evidence the general principles which underlie the type theory.

a scientific autopsy, because the man did not have the proper type of aphasia! As a matter of fact, so near are the disciples of Wundt to the explanation by types that it is only necessary to translate their word *Anlage* by "type," and then apply the connotations of that term in the examination of refractory cases, to bring them into line. I may accordingly sum up in the words of my earlier article (*Philos. Rev.*, II., 395):

"We have in this fact of types the explanation of the contradictory results reached by different investigators in the matter of motor reactions. Some find motor reactions shorter, as I have said above; others do not. The reason is, probably, that in some subjects the 'sensory' type is so pronounced that the attention cannot be held on the muscular reaction without giving confusion and an abortive result. On the other hand, some persons are so clearly 'motor' in ordinary life, that sensory reaction is in like manner artificial, and its time correspondingly long. And yet again others may be neutral as regards sensory or motor preferences. If this be true, another element of 'abounding uncertainty' is introduced into all the results of experiments so far performed in this field, as reflection on the matter will show."

One or two further points, however, may be made which give the correct interpretation more importance than the simple facts in themselves really have. In the first place, an additional tendency seems to show itself when movements become very habitual — a tendency recognized in all discussions of the principle of habit. Habitual performances tend to become independent of consciousness, attention, thought, altogether. This tendency should make itself evident in reaction-time work, and reagents of great practice should show, (1)

diminishing time in all reactions, and (2) diminishing difference between the two kinds of times, sensory and muscular. Further, the same tendency should show itself in a diminishing difference between individuals of different types as they both get more practice. All these results are, I think, clearly shown in those of the earlier researches in which the amount of practice is reported.[1]

And, again, finer distinctions of type follow from the general theory: such distinctions as those clearly established for speech. The "visual," "auditory," and possibly (as in the blind) "touch" types of speech are all included under the head of sensory. As I have said, the speech case *is* a case of finer reaction-time distinctions. And the hand, as used in most reaction experiments, ought to show to a greater or less degree similar distinctions.[2] The cases so far discovered of relatively shorter sensory reactions seem to be, as far as reported, auditory (musicians) and visual (Flournoy's). To determine between "visual" and "auditory" times for any individual, of course the same set of reaction experiments should be made with the two classes of stimulations, each being compared with the muscular reactions to the same stimulus respectively.

[1] Consequently it does not do to say, with Wundt and Külpe, that the "muscular" reaction is more automatic. Of course it is so in those who give a shorter motor reaction — that is sufficient proof of it. But that the sensory time is shorter in others is sufficient proof, also, that in their case the sensory reaction is more automatic. Külpe's two-arm reaction experiment is subject to this criticism, among others (see Wundt, *loc. cit.*, p. 325; Külpe's *Grundriss*, pp. 422 f.).

[2] A possible instance of such variation is seen in the case of Donders, which Wundt has difficulty with (*Phys. Psych.*, iii., ii., p. 268). Say the reagent was "visual" in his type, and we have reason for his shorter reaction to light than to sound, while he still falls under the sensory type in general.

The general result follows (if this hypothesis have acceptance) that the reaction-time experiment becomes of use mainly as a *method*. Distinctions supposed to be established once for all by various researches must be considered as largely individual results, inasmuch as the authors have not reported on the type of the reagent. But for that very reason these results may have great value, as themselves indicating in each case this very thing, the type of one single reagent, and in so far some of the general characteristics of that type. What we now desiderate in a great many departments, as for example, in the treatment of school children, and in the diagnosis of complex mental troubles, is just some method of discovering the type of the individual in hand. If reactions vary in certain great ways, according to the types which they illustrate, then in reaction experimentation we have a great objective method of study. But before the method can be called in any way complete, there should be a detailed re-investigation of the whole question, with a view to the great distinctions of mental type already made out by the pathologists.[1]

A word should be added concerning the position of Professor Flournoy. The hypothesis which I have advanced has been attributed also to Flournoy. I think this is a mistake, at least so far as the publications of Professor Flournoy are taken as evidence. His case, cited of the "type visuel," seems to imply the existence of other types, it is true; and at the close of his second article he raises the question, "si la façon de réagir observée chez M. Y., n'est qu'une singularité individuelle,

[1] I have earlier indicated (*Med. Record, loc. cit.*, and *Philos. Rev., loc. cit.*), the possible use of this method by brain surgeons, an idea which Wallaschek comments on with approval. Certain general indications from reaction-times are already recognized by physicians, especially in investigating various anæsthesias.

ou si elle est un fait général et constant dans le type visuel d'imagination." But what he means in the context by "type visuel" is not what is meant by that phrase in the generalized usage of the pathologists. His case is "visual" in the sense that the man thinks of movements by a visual picture of his arm, rather than by muscle-sense images (just what I have distinguished above as "visual motor" in distinction from "kinæsthetic motor;" and the case is a good confirmation of the conclusions given above under that head). But it does not follow that the man is a "visual" in the broader sense. He might as likely be an "auditive." The most that can be said of Flournoy's case, on the general doctrine of types — other evidence aside — is that he is "sensory" and on my theory his shorter sensory reaction-time proves it. But Flournoy makes no such general application of the theory of types. Indeed, in asking the question which I have quoted from him (*i. e.*, whether all visuals would react as this man did), he shows that he does not mean to bring reactions generally under the type theory. For the real "visual" might give a shorter "visual motor" than "sensory" time — *i. e.*, when the stimulus reacted to is other than visual (say auditory); since then the *visualizing habit* would throw its influence on the side of the motor reaction.

In the matter of the distinction between "visual motor" and "kinæsthetic motor" reactions, however, Flournoy's case clearly anticipated mine in print.[1]

[1] Since revising the proofs of this article I have received a note from M. Flournoy in which he says: "Je suis, d'une façon générale, d'accord avec vous sur l'influence du type d'imagination" (making reference to my article in the *Medical Record*). The reader may now (1902) consult Professor Flournoy's exhaustive and valuable paper, *Observations sur quelques types de réaction simple* (1896).

# XVIII

## THE "TYPE-THEORY" OF REACTION[1]

In the October (1895) No. of *Mind*, Professor Titchener devotes some pages to a very discriminating examination of the recent "Study" of mine in *The Psychological Review* (May, 1895), — the preceding paper, — in which I stated in some detail a theory to explain the variations shown by different reagents in the time of their reactions. His statement of the question is so full and his quotations of my statement of it so generous that I need not now do more than refer the reader to his article, or to mine, for the preliminaries. I may also waive a discussion as to the methods of science in general and the nature of proof — matters of a kind that we either agree upon or would probably continue to disagree upon. All such machinery out of the way, I may be allowed to state a point or two, first on his article, and afterwards on my own.

1. The first point made is this: that I was wrong in calling the "disposition" or "Anlage" view a "theory." That certainly is true; and I claim, as Professor Titchener grants my right to, that my theory goes farther, in attempting to give a psychological explanation of reaction rather than a simple statement of fact.

2. Professor Titchener's explanations regarding what he calls the "Anlage" of the reagent, and the quotations

[1] From *Mind*, Jan. 1896, pp. 81 ff. Although somewhat polemical, this paper is reprinted for the sake of the explanations it gives of points in the preceding chapter.

from the works of others on the same point, still seems to me, in spite of the "four-fold root of sufficient reason" which he presents in numerical order, to be open to my original charge of *circulum in probando*. He says, first, that, in Lange's words, "there are certain persons who are incapable of reacting consistently in the sensorial or muscular way." This I not only admit, but expect as a natural circumstance, if the truth be what my theory says it is. The man of the sensory type, my case of F, for example, complained of just this difficulty: he found himself almost incapable of reacting in the muscular way, being a musician and a man of the auditory type. Is it better to explain this man's condition, first finding out about all that we can, or to drive him out of the laboratory?

Then, under the same heading, Professor Titchener cites Wundt's version of the same incapable man in these words: "there are individuals who are entirely incapable of any steady concentration of the attention." This I admit — the asylums are full of them — and I also admit that they are better out of the laboratory. But this is a very different class from those persons described by Lange; and it is just the confusion of the two kinds of people that makes Mr. Titchener's position seem to me a false one. I find that my case F, if I am patient and do not turn him out too hastily, shows a remarkable power of concentration of his attention upon sounds; he can beat all the laboratory besides at that. And in other directions his attention is very fine. He is, in fact, a high-stand man in his university work generally. So he is in no sense one of Wundt's class who are incapable of any steady concentration of the attention. On the contrary, he can concentrate his attention splendidly, provided we allow him to do it in

his own way. Assuming, then, that Wundt stated just what he meant, I quite agree with him; provided his usage go no further than his words. But coming to the question of usage in the Leipsic laboratory and speaking only by the book, we find the following words in Professor Titchener's article in Wundt's *Studien*.

After saying that his results ought to be published, "weil die Zahlen auf einer strengen Durchführung des zwischen den sogenannten sensoriellen und muscularen Reactionen existierenden Unterschieds beruhen, und daher theils Abweichungen von den früher erhaltenen Zahlen aufweisen, theils zur Erklärung der innerhalb dieser vorhandenen Unregelmässigkeiten dienen können," he goes on to report — "Mitarbeiter in diesem Theil der Untersuchungen sind neun Herren gewesen. Sichere Resultate habe ich aber nur von zweien ausser mir selbst gewinnen können." (*Phil. Studien*, VIII., s. 138.)

Now does Mr. Titchener mean to say that but three only of the nine were capable of any "steady concentration of the attention"? If not so, then where are the six? Are the six "incapable of introspection," as another of Professor Titchener's authorities is quoted to have put it? I happen to know about some of the six, and can say that the average ability of the patrons of the Leipsic laboratory is not so low as this procedure would seem to indicate. So Professor Titchener is not following Wundt's formula of exclusion; he is rather following his own and Lange's formula, and by it excluding those who are "incapable of reacting consistently in the sensorial or muscular way." If one-third of mankind are to be taken to prove that a result is a universal principle, the rest being deliberately excluded because they cannot get the result that the one-third do, then

what theoretical conclusions could not be proved in psychological laboratories?[1] It would be interesting — indeed it would be the only possible justification of the procedure — to have the partial results which the other two-thirds did give, with the criticism of them on the ground of which they were thrown out.

3. Mr. Titchener then says that my charge that the "Leipsic school 'rules out' results which do not accord with the Leipsic theory, but are nevertheless constant and regular results, is altogether unfounded" — quoting passages again from Leumann and Külpe to the effect that due regard should be had to individual differences among reagents. The only results ruled out, he says, "are those which are wholly irregular and inconstant." To this I have two replies to make. First, I may ask: if this be true, why does not Mr. Titchener accept the results of Flournoy, Cattell, and myself, which show tables of cases whose reactions were as regular and constant as the Leipsic results, but which fail to show the sensorial-muscular relation which the Leipsic school believe in. I shall say a word more on this question of relative accuracy of result further on. And second, Professor Titchener overlooks one of the essential factors in the case — the factor in the case, to wit, that relative regularity and constancy may be just the thing we are observing. Results may be *regularly irregular:* and that is just the contrary case to the one which he looks exclusively for, *i. e.*, the case of results which are *regularly regular*. In ruling out all results which are irregular, the Leipsic school beg the question. In matters of the attention it is evident that steadiness, uni-

[1] Of course I do not mean to say that Professor Titchener intentionally adopts only such procedure; but that his "principle of exclusion" appears to work out that sort of result.

formity, ease of fixation, are the opposites of hesitation, now-good-now-bad, easy-then-difficult, efforts. And it is just a part of the phenomenon that my theory attempts to bring to recognition, that the case in reaction is exactly this normal kind of variation. Irregularity may arise, for example, from difficulty in getting the required image or content held up in attention. And I think that the Leipsic school have to recognize and act upon the same principle as soon as they come to ask for the slightest shadow of explanation of their own distinction between the two kinds of reaction. In short, to put the position briefly on this point, I should say that irregularity of result might occur — and we actually have cases of it on each side — in either kind of reaction, and if one should determine beforehand to rule out all cases of such irregularity of the muscular kind, then he might find one-third of his cases remaining to serve as basis of a formulation *exactly the opposite* of that held by the Leipsic school.

I have, further, to thank Professor Titchener for quoting a passage from Külpe to the effect that "if a person is incapable of any vivid ideation of a sense impression, he will give the appropriate direction to his attention by the formation of a corresponding judgment, or by help of the organic sensations arising from the strain set up in the organ of sense or of movement, or perhaps by visual ideas of the stimulus or of the required movement. But it is probable that certain differences in the determination of reaction times are largely referable to the differences in the form of expectation." This is true. It is only another way of saying that these things should be taken into account, and that all variations in individuals should be considered. Professor Flournoy's case is especially valuable as enabling us to follow up one of

the variations which Külpe hints at; and my research into the variation between "visual motor" and "kinæsthetic motor" reactions is a deliberate attempt to clear up one of these distinctions. Külpe wrote in the same passage: "so far there has been no accurate discrimination of all these forms of muscular and sensorial preparation." How then, I may ask, can he say beforehand that the muscular form will turn out in each case to be shorter than the sensorial? One of the merits of the "type theory" is just that it gives us natural lines of advance along which to direct these further investigations.

4. When, therefore, Professor Titchener says that my "demand for a statement of the origin and meaning of the 'disposition' is a demand for the impossible," I have only to cite certain practical considerations to meet his view as to the intrinsic obscureness of "nurture, heredity, and education," so far as this topic involves those things. Is not the fact that F is a musician something of an explanation of his auditive "disposition"? Is not the fact that a man having certain defects of vision has also difficulty in giving visual attention, in so far a reason for his long visual reaction? Is there not now a mass of pathological evidence proving that movement of a limb may be impossible if visual, auditory, or other types of attention cannot be brought into play? And is not this in so far the ground of a theory of the variations which these men show when they are well? In short, is not the pathological theory which I have used in working out the "type-theory" of reaction just a theory of the variations produced by "nurture, heredity, and education"? But even if "dispositions" are theoretically obscure, we should be sure that we have "caught the rabbit" before saying that he is not worth cooking; and this is the task which the "type-theory"

sets itself, — to investigate the so-called "dispositions" and find out what they really are.

Professor Titchener then goes on to examine the evidence upon which my theory rests. I may say before taking up the points which he makes, that I by no means admit the implication that I have anywhere stated all the evidence in what I may call the form of a catalogue, — as he is fond of doing; on the contrary, the article he quotes is mainly the report of a research, and the general considerations are very schematic. I hope later to do more justice to the evidence as a whole.[1] So I shall now only comment on the evidence as he states it, not as I should state it.

1. He objects to my cases on the ground that they were not tested as to their type. Now, in spite of Mr. Titchener's assertion that "there are many methods of testing types," I may say that I do not know of any that are conclusive except those of introspection and pathology. I believe that in most cases a very safe conclusion can be reached by questioning the subject in a variety of ways, *i. e.*, by using the method of introspection. This I have done with my cases, and it is only a phase of the incompleteness of my article, when looked at from a "catalogue" point of view, that I did not state it. Professor Titchener is quite right in asking for it; and later I shall furnish it. He would do psychology a service, however, if he would publish some of the "many methods of testing type, apart from the reaction method."[2]

2. He says of my results: "four persons reacted to

[1] See at the end of this paper an abstract of a fuller discussion and research, which still remains unpublished.

[2] *Cf.* Professor Titchener's further reply on this point (and others as well) in *Mind*, 1896, pp. 236 f.

sound. Two of them, B and S, carried out the investigation of which the present 'Study' is a report: presumably, therefore, they had the type theory in mind throughout. Whether the other two reacted with or without knowledge, we are not told. The greatest reliance is placed upon the times of B and S." Of this I have again two things to say: first, that the research was carried out largely in Toronto at the time when I (B) still accepted the Leipsic distinction as a general one; and my present theory was arrived at only after I had subsequently secured the results reported in the table of F, and largely on the basis of that table, which forced me to alter my former view. This shows for itself in the tables, in both my case and that of S — he too had no such theory when he gave the reactions — for we are the *very two* who do not contradict the sensorial-muscular distinction! What Mr. Titchener means by saying "the greatest reliance is placed upon the times of B and S" passes my comprehension, — as also any ground he may have for the unhandsome charge that I have changed my reaction-times since I wrote my book on *Senses and Intellect*. It looks to me like a case either of the extremest carelessness as to self-contradiction, or of "bluff!" Of course I do not accuse him of the latter: but why strain to make a point which is contradicted by the table which he himself constructs out of mine? It can only deceive the non-elect. My results still show the Leipsic distinction as they always did; so do Mr. Shaw's (S). Mine have only changed in that the distinction is less marked than it used to be; and this I go to the trouble to explain in the same article as probably due to habit and practice, — as my theory again seems at least not to contradict. The times of B and S, therefore, are very neutral to the discussion; that of F and, so

far as examined, that of T, are the ones on which "greatest reliance" is placed, — of those which I have myself investigated.

3. Now, as to accuracy of result, — the point which comes up next. Professor Titchener criticises my tables as to certain results which show variation, quoting only the figures for B and S. "These variations," says he, "call for special explanation." So they do; and I can give it. But, as I have said, these are the two cases which have no great bearing on the discussion. The two cases which are important to my argument and which go with those of other observers to prove the "type-theory" are those of S and C, as I may again repeat. In the case of F the difference between the sensorial and muscular reactions is 40 $\sigma$ and in that of C it is 25 $\sigma$. Is it competent argumentation, in view of these figures, to say: "Professor Baldwin argues from time-differences (22, 18, 21 $\sigma$)," with no shadow of reference to the other cases, especially after declaring, with great inaccuracy, that I placed "greatest reliance upon the times of B and S." The only possible point in my article to which such criticism would apply is the distinction between "visual motor" and "kinæsthetic motor" reactions, where I do use the results of B and S. But this is quite another topic; and while to have confused the two may, in a measure, excuse Professor Titchener's error, it is, I am bound to say, most unfortunate. For in that case, how can Professor Titchener go on to say: "Nevertheless it must be admitted that the tables show some striking results, and that the construction of the type-theory out of them is very ingenious"? This would seem to show that the writer of the sentence did apprehend the bearing of the times of F and C.

4. Flournoy's case. Professor Titchener gives the

details of this case sufficiently. He dismisses it with these words: "All that they [*i. e.*, the Leipsic school] would say is that the 'physical possibility' to react is not, in [our] laboratory experience, a feature of the normal or average mental constitution. Consequently, the mind so constituted cannot be drawn upon to furnish norms of reaction: however interesting its workings may be in other connections." This summary exclusion of cases has been spoken of above. So far from disposing of the case, it shows, in my mind, the plainest confession of inability to do anything with it. It amounts to saying: "This case was investigated; it ought not to have been investigated: the results were published; they ought not to have been published." Other cases are then taken up, *i. e.*, those of Professor Cattell, from whom a letter is cited quoting his two reagents J and D. Cattell says that D supports the type-theory, and that J gives no difference between the two kinds of reaction, — a fact which, of course, fails to support the Leipsic distinction. Professor Cattell then gives a case (unpublished) of a reagent who gave a slower reaction for sound than for light while distracted "by not knowing where the sound was." When this cause of distraction was removed "his reaction (to sound) became much quicker and more regular." Cattell says: this case "supports your [Titchener's] point of view;" and Professor Titchener on this common phenomenon of distraction of attention, dismisses the evidence of Professor Cattell's cases with the phrase "honours are divided." Professor Cattell, on the other hand, in the same letter makes the following explicit declaration: "My own idea is that an unusual direction of the attention lengthens the reaction time, and that when the reaction has been much practised it becomes reflex." If Professor Titchener can get any

comfort from the unpublished case mentioned, it is well, but to me it seems to be quite easy of explanation. The person is uncertain what he is to attend to in certain respects, and so cannot attend quickly or well; as soon, however, as this cause of uncertainty is removed, he can. There is no question here as between types of attention; it is rather a question of good attention and bad attention. And the result is what the type-theory anticipates: with the attention bad the reaction was long; with the attention good it was short. The case is too meagre to be of any value except as a tendency case, — were it not that Professor Titchener uses it again below, forgetting all the proper demands made earlier in his paper for exact figures. As to the Donders case, — it is pure surmise one way and the other; I cited it in my other paper only as showing the length that the Leipsic school are willing to go with their distinctions.

As to additional cases from which the author says I do not claim support, it is equally true that I make no reference to them, again not writing a "catalogue": the main reason that I did not "claim" certain other cases reported in the literature of the topic was that I thought the cases cited were sufficient.

So much, then, for the "evidence of the type-theory." I think that it is strengthened by Mr. Titchener's examination of it. And there is, besides, the great mass of evidence drawn from the pathology of the motor functions, and from the general principles of habit and relative accommodation of the attention, which are stated at some length in my article. All this field is untouched by the examination of the critic, although it is upon those things that — apart from the actual cases reported — I lay "greatest reliance."

But Mr. Titchener is not yet done: he next cites

"evidence against the type-theory." And what he cites he himself describes as "these two negative instances" — *i. e.*, of himself, and of Binet's case of M. Inaudi. As to Professor Titchener's case, as he reports it from his impressions of his own mental life, he simply shows, with quotations from my book of *Mental Development* also in support of it, that type differs in the same individual for different functions, and "shifts" with education for the same function. Both of these points I admit; and I have put both of them in evidence in the book quoted: but how do they bear against the type-theory of reaction? They do not. The reason it is a *type*-theory is just that it allows for such variations; and it matters not whether the variation, in any case, be in a person or in a function. Indeed the ground of origin of types is to be found in part in education, which must necessarily apply to single functions. But I do not think that the little practice that one may give himself in a year or two, or in the case of one function or two, is likely to alter the general type of his reactions. This is all that Professor Titchener's case shows, and even then are we not taking very general statements for figures? Why has not Professor Titchener tested himself by some of those "many methods"? He seems to forget those "many methods" when he now says: "The elucidation of a memory type is by no means an easy matter."

The case of M. Inaudi is to my mind not available. Inaudi is a prodigy of mathematics, investigated by M. Binet and found to be very dependent upon hearing in his calculations. Professor Titchener draws the inference, and it seems that Binet did also, that he should give a remarkably short auditory reaction compared with his other sensorial times. This he did not,

when investigated; and so he is now cited as evidence against my theory. Of course I reply, as Mr. Titchener supposed I should, that this does not show anything about his muscular reaction. And further it is quite too abnormal a case to show anything about the relation of the different kinds of sensory reactions to one another. This arithmetical work on the part of such prodigies is not to be accounted for as due to habit, practice, training of the attention, etc., the usual ground of type distinctions; it is rather a variation of an obscure kind, some sort of twist of which we know really nothing, and in it Mr. Titchener ought to recognize a peculiar *Anlage* if there ever was one, and promptly rule it out of the laboratory. I quite agree with M. Binet in saying in the passage which Mr. Titchener quotes: "It must not be supposed that M. Inaudi is an auditive outside his professional exercises in calculation. He is an auditive for calculation, *i. e.*, for one partial, special, sharply defined memory." It seems to me quite likely — if this freaky calculating gift be amenable to any rules — that for this function his muscular reaction would be longer than the sensory. But for his other senses it seems to me also probable that he was reacting all the time in a muscular way. And even though M. Inaudi gave all his reactions with muscular attention, as Professor Titchener supposes, how does that in any way "tell heavily against the type-theory"? That theory does not say that no one shall react in that way if he wants to. In that case one would only have to suppose that Inaudi's reactions of the two kinds to sound were about equal and both very short. This is supported by the lack of conclusive evidence that he was much more auditive than motor, even in his calculating.

After all this rather tiring discussion, in which there

is on both sides too much hair-splitting, hypothetical interpretation of cases, and conjecture as to what a reagent "ought" to do on this view or on that, I find relief in turning to one or two of the larger bearings of the subject. This may be taken to be a further statement of aspects of the general position now sufficiently well characterized by the phase "type-theory." At the same time, I desire to thank Professor Titchener for the careful consideration he has given to my point of view.

1. It is not a necessary corollary from the type-theory that a subject be of the same type in his reactions with the hands to sounds, sights, etc., that he is in his speech. I think, as I said in my earlier article, that this is oftener so than not; and it was this thought that first led me to look to the general doctrine of types for an explanation of the variations in different persons' times. We find that speech itself may vary in its type very remarkably in the same individual from one language to another, especially when the conditions of learning have been fairly consistent and of long duration. The case described by Ballet, and my own case of relative contrast in type as between my use of French and German,[1] are instances of this. And the pathological instances of damage to the brain which incapacitates the patient from using one language while another may remain intact — together with many interesting minor variations — tend to furnish evidence in the same direction. It should not surprise us, therefore, if it should finally become evident that a hand-function, such, say, as handwriting, in any individual, was most readily stimulated by some other centre in the brain than that which serves for the "cue" to speech. I am concerned to say this here

[1] See my *Mental Development*, pp. 435, 461 note. Ballet's case is to be found in his *Le langage intérieur*, p. 62.

since in the article cited Professor Titchener holds me somewhat strictly to the complete parallelism between speech, on the one hand, and hand-functions on the other, interpreting my statement that way — with some right to, certainly, from the partial statements of my earlier papers.

2. An important requirement, which Professor Titchener has not brought up against the type-theory, is yet to be fulfilled; and I hope to go into the consideration of it and the point mentioned immediately above when I publish the further experimental results which are accumulating in my laboratory. The requirement is this: should not any theory of the variations in the relative lengths of the two sorts of reaction in different individuals give some kind of an account of the great disproportion between the number of cases which give a shorter muscular, as against those which give a shorter sensorial, reaction time? Professor Titchener may find it difficult to form such a requirement, since it would seem to commit him to the recognition of normal instances of the latter. But those of us who believe in testing everybody, and in making the differences themselves fruitful data for theory, are bound to recognize the disproportion spoken of, although, for myself, I think when more laboratory workers take persons just as they come, the relative numbers will probably be more evenly adjusted.

Yet so far as this disproportion does exist, as it appears to, I think it really bears out the analogy of reactions generally with speech. The discussions recently published on so-called "internal speech" turn, it will be remembered, not on the question as to whether there are the same number of cases of persons sensory as motor in their speech, but rather on the question

whether all men are not motor. As I have put the question elsewhere, for convenience in grouping the evidence *pro* and *con*, "are the kinæsthetic memory centres intrinsic to speech" or not?[1] There is a school of physiologists and psychologists, represented by Stricker of Vienna, who go so far as to deny that any person can speak without the incipient stimulation of the motor organs involved. They seem to me to be for that discussion about in the position that the Leipsic people are for the discussion of reaction. And while the case for speech seems to be going clearly against them on pathological grounds, yet they have by far the larger number of cases. The literature seems to show a great disproportion of cases in favor of the motor aphasias: and that fact has seemed to keep back the recognition of the sensory cases. Those who are familiar with the literature of aphasia will, I think, agree that the type-theory has had this disproportion to contend with also there. So, while I may not stop to make good the indications now noted of the state of the facts in regard to aphasia, perhaps sufficient has been said to show that, far from being a difficulty to the type-theory of reaction that the disproportion of cases is as it is, it rather seems to extend and strengthen the analogy with the mechanism of speech.

P. S. Since writing and despatching the article above, I have received a letter from Professor James R. Angell of the University of Chicago which promises further experimental confirmation of the type-theory. He says, under date of Nov. 9, 1895: "It may interest you, in connection with Titchener's criticism of your theory of reaction-time peculiarities, to know that the

[1] *Philosophical Review*, July, 1893, p. 386, incorporated in *Mental Development*, chap. xiv.

very time your article appeared, I had all ready a considerable body of experiments remarkably similar to yours, from which I had drawn conclusions absurdly like your own. I decided to postpone publishing until I could supplement them with more detailed work. I hope to get the thing into print before long. It seems to substantiate entirely the general principle underlying your view, although introducing some minor modifications."

Professor Angell's paper appeared in *The Psychological Review*, May, 1896.

The following paragraph is an abstract from the *Proc. Amer. Psych. Assoc.*, printed in *The Psychological Review*, March, 1898, p. 165. It reports further experimental results.

"*A Research on 'Type Variations in Reaction Times.'*[1] This paper takes up two problems: (1) To ascertain how far the indications of mental type secured by differences in simple reaction time, as between 'sensory' and 'muscular' reaction, agree with the results of introspective determination of mental type (independently carried out on the same subjects). (2) To determine whether the differences between 'sensory' and 'muscular' reactions for the hand, to various stimulations, are of the same sort as the corresponding differences for speech in the same subjects. Many series of experiments were made on each of four subjects with the following general results. In each of the subjects *both the correspondences suggested above were found to hold:* the most striking case being that of Mr. J. F. Crawford, whose simple sensory reaction to sound and light is very much shorter than his muscular reaction, *for both hand and mouth reactions*[1] and whose mental type, as independently deter-

[1] A cut showing a new form of mouth-key was shown; it is figured in the *Intermédiare des Biologistes*, March 5, 1898.

mined by various introspective tests, *is unmistakably auditory*. In two of the subjects the agreement between hand and mouth reaction is negative; namely, there is no difference between sensory and muscular reactions for either function; and in these persons the same condition is reflected in their great difficulty in securing clear introspective indications of type. In the fourth case the subject finds himself visual in his type, and his reactions show sensory times slightly shorter than the muscular in both hand and mouth functions. It is remarkable that in these four subjects — three never having been tested before, and the fourth only slightly — *there is no instance of muscular reaction shorter than sensory for either hand or mouth to either sound or light.* The author considers the results as supplying important evidence of the truth of the type-theory of reaction. Full details of the investigation are to be published in an early issue of *The Psychological Review*."

# XIX

## THE PSYCHOLOGY OF RELIGION[1]

### I. Historical

The psychology of religion has not had due attention. The views which make religion essentially non-natural have either, on the one hand, regarded man as naturally unreligious or irreligious, or have, on the other hand, cut the psychological cloth to suit a theological pattern. The positive views current on the subject may be put under certain headings.

(1) The Religious Instinct view. This finds in the religious motive an innate "instinct," predisposition, or propensity. This, like all theories which rest on native endowment, closes the door to analysis, and, moreover, find justification for constructing this assumed "instinct" in the way which their respective religious or theological theories demand.

(2) The Intuition view and the Intellectualists. The view that the idea of God is an intuition is associated with the "instinct" view in finding something native and irreducible upon which to rest the justification of positive religion; it differs, however, from it in allowing an indefinite development of argumentation in support of the intuition. In this characteristic the intuition view lays emphasis upon the theistic "proofs," and con-

[1] *Cf.* the writer's *Dict. of Philosophy and Psychology*, art. "Religion" (psychology of). Lecture before the Princeton Philosophical Seminary, March 7, 1902.

siders the religious state to be largely "belief" based upon argument, or "faith" based upon authority, resting alike in formulations concerning the divine being, or upon direct revelation. Natural religion, or theology, and deistic teleology were developed either with aid from certain sacred books or by "natural reason." This view, in which intellectual factors predominated, characterized ecclesiastical, mediæval, and pre-Kantian thought generally. The completed intuition position arose as a restatement of intellectualism in view of the destructive criticism of Kant; the intuition of God was Kant's "idea of God," considered not as a formal principle of theoretical reason, but, like the intuitions generally, as an immediate deliverance of consciousness, having objective validity. The Scottish philosophers, who were psychological in their presuppositions, attempted to work out a psychology of the intuitions, and in so doing led up to a religious psychology, properly so-called.

(3) The Analytic and "Critical" point of view. This consists in an analysis, or at least an attempt at direct examination, of the developed religious sentiment. It is this which yielded the best psychological results up to the beginning of the late psychological movement called below "genetic." It is here that the classical views of Kant, Schleiermacher, Matthew Arnold, and others belong, — views which were permanent contributions to the subject because they rested upon real psychological facts. The two first-mentioned may be taken as representative of (*a*) the rational and (*b*) the emotional views respectively.

(*a*) With Kant the central fact of religion is the idea of God, which is a regulative principle of the practical reason. The religious and the moral life stand together upon this postulate. Religion is recognition of God and

reverence for Him. This places the emphasis on reason, but reason as regulative of the life of practice. And furthermore, reason (*Vernunft*) is not intelligence (*Verstand*); and Kant's view of religion is therefore rational, not intellectual. He refutes the strictly intellectual view by his famous criticism of the arguments for the existence of God, and also by his failure to find that, even as a principle of pure or theoretical reason, the idea of God is ontologically valid. Furthermore, with Kant religion is not an independent problem, and much less is the psychology of it; it enters into the philosophical or epistemological problem, inasmuch as the idea of God claims for itself theoretical and practical universality, and so comes into the sphere of the dialectic of pure and practical reason. Yet, as in many other problems into which both psychological and epistemological factors enter, Kant's work is of the first importance, both as leading to the intuition view in the way mentioned above, and also, and more especially, in making necessary a reconstruction in which psychological facts should lead the way. This had not been possible so long as dogmatic theology with its logical argumentation, as crystallized in the "proofs," remained uncriticised.

(*b*) The school of Schleiermacher — called above emotionalists — went further than Kant in denying to religion any sphere having separate intellectual content. The healing of the breach between *Verstand* and *Vernunft*, together with the reconciliation of pure and practical reason in the post-Kantian Identity Philosophy, left no dualism anywhere — no chasm on the right bank of which religion might perch and find its view directed backwards upon the secular or experiential fields of knowledge and faith. This made it necessary to find in

religion some form of psychological reaction upon the one universal object, the Absolute, implicit in knowledge. This reaction is emotional, taking form in two phases of sentiment which give character to religious experience and furnish its criteria. These are "feeling of dependence" upon God, the object of worship, and "feeling of mystery," awe, reverence towards Him.

The work of this school has the advantage, from the psychological point of view, of pointing out definite psychological experiences as necessary to religion — a thing which the intellectualists found it impossible to do, seeing that the idea of God, whether content or intuition, is universal and, in so far, undefinable; it is essentially a universal of all experience. This led the way to — or at least was quite consistent with it — the positive or scientific investigation which is now of the first importance, and which in its two-fold form may be called "genetic."

(4) Genetic or Scientific Research by the historical and evolution methods. This has taken on two great forms, respectively named anthropological and psychological. It deals with the origin and development of religion, and may therefore be distinguished as "genetic."

(*a*) The Anthropogenetic view. The treatment of religion as illustrating historical evolution is now yielding most important results.[1] As to the anthropological problem, we may note (1) that this study, by recognizing the essentially religious nature of primitive rites and cults, confirms the view that no one form of intellectual content — no one "idea" as such — is necessary to religion. Rather what is common to "low" and "high" religions

[1] The reader may consult the articles on the Evolution and Philosophy of "Religion," written by other hands, in the *Dictionary of Philosophy*.

alike is certain active and emotional attitudes which ideas of various objects may call forth. Yet only such objects as *do* call these attitudes forth are religious, and this throws the actual criterion on the side of emotion and action. Here anthropology confirms the "emotional" view (*cf. b* below).

(2) The objects of religious veneration, therefore, have an *emotionally symbolic value.* The gods are not experienced objects; they are termini for dependence, faith, reverence, awe, etc. Their value is necessarily pitched higher as man develops and reduces much of his experience to objective changes obeying law. The God is ever the something behind the cloud, the someone behind nature — the someone who breaks law and works his will for his own, for ours, for a priest's, for a redeemer's sake. And cults, religious institutions, ceremonials, sacrifices, etc., are attempts to cope with this unexperienced higher something; to bring into experience for satisfaction, help, salvation, that which cannot be known to sense or opened to knowledge.

(3) This, then, it becomes evident, raises a question which psychology alone can answer: why this constant drift, this groping beyond sense and thought, this demand — recurring in this form and that at every stage of more culture and of less culture — for a more-than-I, a being beyond, a God? This is the question of the impulse, propensity, spring of action which religion involves; and we come back to psychology, and indeed to the instinct view, in case we find no further analysis possible.

(4) In later investigations, moreover, the fact is constantly recognized that religion is a social phenomenon. No man is religious by himself, nor does he choose his God, nor devise his offering, nor enjoy his blessing alone.

The whole is most intimately associated with social convention, custom, law — nay, often it is these, and about the whole of these. The priest is ruler, lawgiver, medicine man, no less than agent and embodiment of the divine afflatus. Religious sanctions often dictate social and ethical sanctions, though this dependence at later stages of culture may be reversed.[1]

(5) The object of religion has *personal form*, whatever that may mean at the stage of evolution reached by a people. This is one of the facts earliest observed, and perhaps the one most universally admitted by anthropologists. The theories of Animism, Ghost and Ancestor Worship, religious Personification and Ejection, all recognize and aim to formulate this class of phenomena.

(*b*) The Psychogenetic view. Here finally the appeal is made directly to psychological investigation; and having taken account of anthropological researches as showing actual religious products embodied in institutions, the psychologist comes to his investigation with the checks and controls afforded by so much historical knowledge. This narrows his quest; for if religion is an active and emotional experience, a social experience, and also an evolutional or racial product, in these we have guiding threads of importance. Then, as to the object, it follows from the historical facts that the object of religion is a symbol, a meaning or intent, not a content; it may preserve its meaning while changing its content. What genetic notion fulfils this condition? Again, how can this object take on a series of *quasi-personal*

[1] This is recognized as a safe result by the writers of the articles on philosophy and evolution of religion already referred to. The readers may consult the writer's treatment of the religious sanction, as related to other forms of sanction, in the volume *Social and Ethical Interpretations*, chaps. viii., x. See also the further remarks below, iii.

forms, which involve social relationships? This also restricts and aids the psychological determination.

## II. Psychological

The strictly psychological problem considered as meeting these requirements falls apart into two: we ask for an account (1) of the unity of religious experience, and (2) of the variety of religious experience. The question of unity is that of the one religious spring of action common to all religions and normal to all individuals. The second question is as to how this common impulse or motive takes the forms shown in different religions (comparative religion), in the genetic stages in the history of culture (evolution of religion), and in religious individuals (the psychology of prophets, religious seers, founders of sects, the inspired, the genius, etc.) The latter constitutes a variational psychology of religion, and can proceed only on the basis of the determination of the normal religious impulse, although by collecting data it may aid the former, as do variational statistics in other branches of inquiry. Very little has been done under this latter head (*cf.*, however, James, *The Variety of Religious Experience*, Edinburgh Gifford Lectures, already delivered but not yet published).

In dealing with the unity of religious experience, the indications derived from anthropology may serve to guide us. They make it necessary to say, first, that religious sentiment always involves three factors: (1) the recognition of other persons as standing in the same relation to the object of worship as one's self, *i. e.*, religion is a public thing involving duties and rights as between fellow men (the social factor); (2) the recognition of the religious object as also a person of the same sort

as one's fellow man and one's self, though of higher character (the personifying factor); (3) the progressive reinterpretation of both the foregoing factors as the genetic development of the thought of personality proceeds (the genetic personal factor).

These factors, taken separately, present problems having certain analogies in the psychology of the active life. The social factor presents substantially the same problem as that of sympathy, notably ethical sympathy: *how* do I recognize another as standing in the relation of duties and right to myself, both being under a common law? Here the new theory of "ejection" is available; ego and alter are one thought by the reading into what is not-I of experience analogous to my own. The second or personifying factor also involves "ejection;" yet here the reading-in is of the higher self — the law-abiding general or ethical self — which the private self-thought does not exhaust. God is a higher, a perfect self, having what the present writer has called "projective" elements.[1] The third problem is that of the genetic development of the personal self-thought to ever higher levels, from the organic to the impulsive, from impulse to intelligence, from intelligence to reflection: a development which carries with it the necessary reconstruction of the "other" person, and also of the God-person, since it gives them its own character and content, by the process of "ejection." This, then, makes religion a function of the personal development which is also social; and an adequate theory of the rise of personal self-consciousness accounts *ipso facto* also for the religious life. The impulse to read self into others, *i. e.*, to recognize personality as more than individual, with its final development in the recognition of ideal

[1] Above, pp. 190 ff.

personality — this is what, in my opinion, a genetic account of religion requires.

Religious sentiment, then, falls generically in the class called personal sentiments — emotional dispositions arising about the thought of personality, ethical sentiment being also in this class. It remains, then, to determine the specific character of this sentiment, the marks which distinguish it from others of its class.

Here the determinations of the analytic and "emotional" schools are of extreme value. The "feeling of dependence" and the feeling of "awe or reverence" are alike the results of analysis and the direct inference from religious ceremonial and rite. The gods are propitiated to secure their favor and to mitigate or appease their wrath — both motives of dependence. They are served and worshipped with rites which are mystical, magical, and symbolic — evidence in turn of the essential feeling of mystic awe with which they are approached. These two sentiments, therefore, stand out as by general agreement common and universal. They would seem, therefore, to give peculiar quality and coefficient to the religious state of mind; and they follow also from two lines of inquiry, both of which yield psychological confirmation of the main result so far attained.

(*a*) The act of ejection whereby the self is read into another has a twofold character: so far as it is of elements completely understood and experienced, the "other" — in this case, God — is taken to have certain definite attributes. And these attributes, belonging to an infinite or very great personality, may be invoked for favour, or denied with loss. So, just as we "depend" on other persons who are situated to aid or damage us — the parent, the patron, the great friend — so, though to a fuller degree, we feel dependence on the

Great Person of our faith. But ejection involves more than this. We find that our personal growth is one not merely of "reading-in" into others, but of appropriation, of "reading-in" into one's self. We constantly grow by imitative interpretation of the acts, habits, states of others. There is thus a give-and-take — a "dialectic" — of an ejective kind going on. Not only are there elements in the other person which we understand and intelligently anticipate with our feeling of dependence, but there grows up a habit of mind which anticipates the unknown, the not-yet-learned, elements of character of those from whom we learn. This we are not able to characterize in advance; it is mysterious, awful. The sense of awe arises in the presence of the greater personality. This is therefore the origin of that aspect of religious emotion known as reverence or awe.

(*b*) The study of the actual rise of personal self-consciousness in the child adds striking confirmation, in the opinion of the writer, to these determinations. The genetic stages of the religious emotions are seen rising about the consciousness of self. And the consciousness of self grows up by the "dialectic of personal growth" thus briefly indicated. Self is a social outcome, and with it religion, which is a function of this growth, is a social phenomenon as well.[1]

As to the varieties of religious experience, certain indications legitimately follow. The unity of religious experience is the unity of normal self-consciousness; the varieties of religious experience indicate or flow from variations of self-consciousness. This point might be carried out in great detail. The alterations of self on

[1] *Cf.* for the detailed carrying out of these positions, the writer's *Social and Eth. Interpret.*

the side of depression show themselves in all sorts of religious pessimism, melancholy, dejection, with corresponding sense of depression, conviction of sin, physical and moral laceration, and asceticism. The exaltation of self, on the other hand, embodies itself in prophecy, religious optimism, forms of personal alliance with God, inspiration, visions, religious pride, and sinlessness. These are merely opposing categories, not exact descriptions; and only the subtleties of change which personal self-consciousness undergoes in its variations or in normal temperamental varieties can serve as basis for tracing the actual varieties of religious sentiment and life. But the connection between the two is beyond dispute. Witness also the forms of so-called "religious mania," and other mental aberrations, of which striking religious experience is a main symptom, and note the presence therein of marked alterations of self-consciousness. It is a new religious personality which has the new revelation, inspiration, commission of vengeance, or other part to play, and it is in the structure of his consciousness of self that the reason of it is to be sought.

## III. Sociological

When we come to enquire, from an objective or sociological point of view, into the actual relation to each other of the phases of religion covered by the phrase "unity and variety of religious experience," certain interesting questions emerge. The problem of the place of religion in social evolution involves the determination of the rôle of what is essential to religion — that which constitutes the unity of religion — in human history.[1]

[1] The question as to what is due to varieties in religion — religious personalities, sects, cults, etc., as such, I am not now taking up. The rôle of

The positions taken above, as to the psychological factors of religion, warrant, I think, certain statements which are set forth below and which in part repeat and in part supplement the views developed in the work referred to.

*First*, the same movement in the idealization of personality which leads to the postulation of a deity, also produces the social, ethical, and other judgments by which the deity is given positive form; that is, the attributes of the deity at any stage of religious development are drawn from the thought of ideal personality. Consequently the causal, teleological, and ethical determinations of the social group are reflected in its religious thought. Religion is the embodiment on the part of society of the highest personality. This leads, *second*, to the view that religious truth, understanding by it all the *meaning* of religion in any of its aspects, can not rise higher than the determination of personality made by the group — *their* ethical, social, intellectual judgment must exhaust their religion. A savage people will have a savage religion, and their religion will reflect the degree of their savagery. If cause and effect is thought of in terms of rude magic, if the ethical code is one of private revenge, sexual licence, the heroism of brute courage, all these things will characterize the religious cult and become embodied in the religious institutions, formulations, and traditions of such a community. *Third*, this makes religion a conservative, not a progressive factor in social evolution; and this, I take it, is its main social function. Seeing that religion in its growth follows step by step upon the growth of personal consciousness and that no new religious thought can

the great man, here as elsewhere, is important in the theory of history; that of the religious genius is in some respects peculiar.

prevail until the higher thinking of individuals towards it is generalized in a public and socially adoptible form — by which indeed much of its novelty and progressive character is generally lost — it follows that religious formulations always lag behind the best intuitions of the best minds. Such individuals often make private interpretations of religious formulations to satisfy themselves. The popular understanding of religious theorems is never the truest nor the most ethical. The fact that religion is, in its nature, a public thing and is as such mainly conservative, has many illustrations in the history of mankind. Religious conservatism has been the cloak of religious fanaticism, the justification of persecutions, the reason for the "warfare of science and religion" throughout all human history. There are certain more special reasons for this — all, however, phases of the general truth now set forth — which it may be well to indicate.

Religion has, by natural right, the sanction of supernatural authority. The deity it is who, by the rise of the religious sentiment itself, is thought in the religious categories at any time in force. Religious institutions are his home; they embody his worship; doctrines are truths of and about him; injunctions and prescriptions of religion are not only socially and ethically sanctioned, but also supernaturally. The ideal person is infinite in all his attributes. Again, the same appears from the side of the aspect of religious sentiment called reverence or awe. If there be in the religious personality an undiscovered something, unknowable, awful, which is hidden behind the cloud, in this aspect, also, that of the mysterious, religious emotion is pitched at the same high supernatural level. Witness the "burning bush," the revelation only of the hinder parts, the mysteries of the Shechinah — all glimpses of

what transcends the known and presents to the worshipper what is essentially a miraculous vision.

So constituted there can be no doubt that religious sanctions, and religious motives, have been among the most powerful in the evolution of man. It is the inevitableness and the naturalness of the supernatural — to speak in a quite justifiable paradox — that makes it so extraordinary a force in human life. But it is our present object to show that it is a conservative, a saving and refining, not a developing, innovating, progressive force. Religion is a brake upon the wheel of social evolution, an anchor to the ship — to change the figure — and for this reason when we look backwards upon the path of ethical progress, let us say, we find her the mother of some of the conflicts described upon the very saddest pages of history. She has set up, as permanent, ideals which by their very nature as ideals were to be transcended and destroyed. She has formulated dogmas which have fettered the human mind for generations. She must by divine right make infallible decrees; while, even in her midst, the religious individual of profounder insight pleads with might and main for broader truths, wider humanity, and purer morals.

It would be instructive, did space permit, to trace out two further influences by which this determination of the essential position of religion in human culture is illustrated and at the same time confirmed. One is the historical alliance of church and state, which, when looked at genetically, were better described as the undifferentiation of church and state; and the other is the great fact of tradition, ecclesiastical tradition, together with its embodiment in sacred books.

As to the first of these, I think the anthropological evidence bears out the view that a very early form of

social life may be described as politico-religious. The utility of the authority embodied in a quasi-political organization was immensely enhanced in early societies by the additional solidarity secured through the religious sentiments. So we find one set of public dignitaries, institutions, rites, etc., having two functions: the one appealing to strictly utilitarian motives of defence, offence, public industry, economy, etc., and the other, in the main ancillary to the first, that of religion, to emotional motives and claiming the additional sanction of the supernatural. One, the religious, depicts the organization of sentiment in the constitution of society; the other, the political, the organization of action. Each, however, consolidated the social group. In process of time they became differentiated with the growth of individualism — a growth which illustrates the reverse side of our general problem, and introduces a new set of considerations, to be briefly presented below. But it may be added that the state, too, is essentially conservative; it grows by very gradual accretions to the body of social and political practice. Hence the alliance of church and state not only enhances the conservatism of each, so long as it remains in force, but also reduces the influence and initiative of individuals. In my book I have illustrated the two types of social change by a contrast between the growth of constitutional government in England which shows conservative and slow progress, with the corresponding development of republicanism in France, where individualism got the upper hand. It may be added that in France, church and state went down together, while in England there is still an established church: facts which bring out the truth that the union of these two great social institutions operates in the interests of conservatism.

The other factor, tradition, bears to the same result, but more evidently and with more direct justification. Tradition in the church has the inviolability which attaches to infallible doctrine. Its own inerrancy is itself a part of the tradition. This adds enormously to the force of what is traditional and in so far again makes religion not only a conservative but often a hindering factor in social evolution.[1] I cannot enlarge upon this, but the facts are so plain that enlargement is really unnecessary.

Turning now briefly to the final branch of our enquiry, we are to look upon the reverse side of the shield: the reactive influence of religion upon individual thought and sentiment. Such a reaction is equally intrinsic to personal development. The individual grows by the incorporation of elements of social suggestion. He is first of all a creature of conformity. His judgments of value are all formed by social give and take, and his religious conformities — giving satisfaction as they do to the highest sentiments of his nature — are, especially when in alliance with political and other social sanctions, of first-rate importance in the development of his personal competence as an individual. Religion becomes from this point of view a prop to the ethical life — nay more, an essential ingredient in it. Without the recognition of the ideal self embodied in religious institutions, and necessarily so embodied, ethical growth is impossible; for the ethical ideal is at each stage of culture the same personal ideal. Religion has, therefore, also a positive social rôle: it contributes a pedagogical, or more properly speaking a strictly psychological, strain to the genetic constitution of our moral

[1] Witness, for instance, the desperate opposition of the ecclesiastical authorities in the southern states to the freeing of the negro slaves.

nature. This leads us to recognize explicitly what is so often vaguely discerned by religious teachers, and more distinctly felt in their own experience by strong religious natures, that the fate of high morality is in some way bound up with the fate of positive religion. In my personal opinion the question resolves itself into this: the problem as to whether, in the continued evolution of society, the ethical sanction can retain its force, if bereft of the personal ideal which, in its recognition of the supernatural, it is the province of religion to justify. The ethical nature certainly postulates such an ideal; but it is in the sphere of religion that those objects are found upon which the ideal emotions aroused by such an ideal may terminate. Certainly, the schemes which have set out hitherto to propose substitutes for Deity have not worked — the religion of humanity, the religion of free thought, the religion of personal renunciation. And I think the latest of the greater writers who have come to such a conclusion — that social evolution may issue in what this writer calls the "non-religion of the future" — makes the matter plainer by his explicit recognition of the social character of religion. I refer to M. Guyau. M. Guyau thinks that the reverence for and pursuit of truth, by the methods of science, will purge society of all religion. But it is difficult to see how this can be if it be true not only, as M. Guyau admits, that the social life is intrinsic to religious sentiment, but also that, as we are here contending, religion is the natural outcome of factors which are intrinsic to social organization. If our present position be true, then to remove religion would be to leave society a different thing by so much as the presence of certain typical social and ethical sentiments and modes of conduct may normally count for in its organization.

# XX

## SHORTER PHILOSOPHICAL PAPERS

### I. Theism and Immortality [1]

The time given me by the Editor in his kind request to write something appropriate to the Easter season, and from a philosophical point of view, on this subject, is so short that I can only indicate a general way of looking at the matter of the future life.

Of course philosophy has no peculiar point of view, nor has psychology. Philosophy is only itself a way of looking at life and its implications; and psychology is largely a body of those evident truths which we all carry about with us. But nevertheless the student of these subjects comes to see where the emphasis falls, acquires the habit of tracking out and criticising loose opinions in everybody; and so the thought to which philosophy holds more firmly really represents, I take it, the deeper-going intuitions and more emphatic intellectual and moral endeavors of the time. And I shall simply endeavor to point out the bearing which current thought, as I understand it — the thought of the last half-century, which has proved itself fertile in psychology, ethics, and metaphysics — bears upon this matter of immortality.

In the first place, the way of approaching the question of a future life is still, as formerly, but more emphatically,

[1] From *The New York Independent*, April 2, 1896.

the way of the theistic problem. The existence of God in a future life — that is the very meaning of a future life. If the philosopher finds himself unable to realize a fair degree of assurance that the world has in it a great Intelligence, whose thought the world is, whose existence is of old who is ever living while the universe is, and just because the universe cannot be without it — then such a one finds that there is no meaning in the question of a future life; for in criticising God out of the universe, he has laid himself low, and all other intellectual and moral beings too. The lesser must go with the greater; God gone, who are we? This is, as I have intimated, an old way of getting at the question of immortality, the way through the theistic problem; but philosophy has seemed to confirm it in two ways: by naturalizing God, if I may so speak, and then by supernaturalizing nature, especially human nature, man. These points may be explained a little; and I may best do it by drawing on psychology.

The old theistic "proofs" were argumentative, logical. They proceeded on certain physiological assumptions, it is true, such as the "idea of God," "the idea of the perfect," the "notion of design," etc. But these psychological assumptions were uncriticised. The stress fell on the arguments. As arguments they must conform to rigid logical rules and formulas — formulas which took the ideas and notions out of the living whole of our thought for the most part, and made them abstractions to be reasoned about. Now I do not mean to say that such argumentation has no value; it was the method of philosophy when Descartes announced his "first and second ontological" arguments, and when Anselm developed his famous argument from the "perfection" of the notion of God. But it is now evident

from the course of thought on the question, that the validity of such proofs rests on the straightness and correctness of the argument; on the "distribution" of this term and the "quantification," or the "universality," or the "conceivableness," of that. Kant saw that the risk in this was too large. God is too great a concession to make to logical formulas. It will never satisfy mankind to make God a "notion" in the first place — a logical universal — and then try by formulas to get a corresponding "reality" into human life. Such proofs — even granted that they "proved" — so long as they stood alone, really "denaturalized" God out of his own universe. They led right on to Deism. And it was Kant's endeavor, after showing this, to "naturalize" God again through what he called the "moral argument." And with what I am thus calling in a figure the "naturalization" of God in man and nature, Kant found belief in immortality also.

Now I am going to put this "moral argument" in my own way and on strictly psychological grounds. What we really want to know in this matter of theism is whether God is a reality. And instead of starting to find out what the idea of God includes, psychology rather begins at the other end; it seeks to find out what we mean by reality. What is real? How is anything real?

The answer is — assuming much analysis and criticism — that the real is that which we actually find, what we cannot help finding, what we have to reckon with, what our nature presupposes and inevitably demands.[1] Things and events are divided off, in our mental lives and with the growth of our experience, into certain great groups representing kinds, or spheres, of reality. The development of these spheres is a matter of prac-

[1] The reader may refer to the discussion of "reality" above, pp. 60 ff.

tical necessity with us; we have to distinguish the external world from the world of memory, the world of science from the world of art. In these things we have no choice, provided — we be not crazy! Now what we mean by "reality" is just a group of experiences normally organized in a certain way; and we believe in realities when we recognize this tendency of our experiences to fall into certain characteristic forms of organization. We do the organizing, and so assert the reality as being there to be organized. These realities we need, and we use them practically as termini, fulcra, points of resistance, for our active conduct and living.

A reality, then, is a form of organized experience which our mental nature has to have in order to be the mental nature it is and to grow as such. We naturally demand these realities, because we are getting them in answer to this demand. And that we need them and get them, that is their proof. That the external world is real means simply that it is an inevitable way that the mind has of organizing what it finds in that certain sphere of its experience which we call sense-perception. Truth is the sort of reality which we reach by an equally inexorable demand of our nature that we recognize what is logical. *And our ethical and religious life in organizing its experience reaches the reality which we call God.* I had occasion to say what follows some time ago in a book written for scientific purposes only: —

"There is moral and esthetic reality no less than logical reality; and there is the same reason for believing in the one that there is in the other, for both rest upon the fact that our mental nature demands certain kinds of satisfac-

tion, and we find it possible to get them. Sensational reality will not satisfy our logical demands, for nature is often refractory and illogical. Neither will logic satisfy our moral and esthetic demands, for the logically true is often immoral and hideous. It is well, therefore, to write large the truth that logical consistency is not the whole of reality, and that the revolt of the heart against fact is often as legitimate a measure of the true in this shifting universe as is the cold denial given by rational conviction to the vagaries of casual feeling."

This what I mean by the word " naturalization ; " this finding of the sort of reality we need in the experience which stimulates the need. God is the reality which our moral and spiritual nature needs and finds, and to make his reality depend entirely on the ability of the logical processes to cope with his reality — that seems to me to "denaturalize" him out of the very sphere in which alone his reality has any significance. What we need in God is a personal presence, not a logical postulate. To the Deist, God is not a presence; he is afar off: he is not a citizen of the world, our mental world ; he is the director of a machine, who is somewhat afraid of his machine and only touches it when he has to. And there are a good many theological Deists in these days.

Of course the strength of this position is the psychological view that the final needs of our nature — those that arise in the organization of experience in this form or that — are all "equal before law." Each is its own justification. So much comes from psychology. But logic also has now practically accepted as much. The doctrine of "judgment" in the later Logics (Brentano, Erdmann, Sigwart) rests upon the same truth. Judgment is mental assent, acceptance, assurance, ratification, of reality. Without this, logic is a shell of tau-

tologies. So, even in logic, proof is no longer a thing merely of "moods and figures;" it is a matter of belief. No logic as such can prove reality, but it is equally true that no logic can eradicate belief in it, nor in any item of it, from external reality up to God.

This general point of view is now current in the most diverse philosophies, since they are becoming more agreed on their common psychological foundations. Call it the "immanence" of God with the idealists — all right; that does away entirely with the "denaturalization" process. Call it "law" with the naturalists — all right, Mr. Balfour's recent grotesque scare-crow picture of the "naturalist" to the contrary notwithstanding; for who would be "naturalized" in a kingdom without law, or where the law laid waste the very mental nature on the basis of which he reached his belief in the kingdom? Mental law is natural law. It is just the postulate of immortality that there is continuity of mental life and law from this to the other side of the river. Call it "environment" with the evolutionist — all right; for it is just the point of the "moral argument," that God is through and through the environment in such a way that by our mental organization of our experiences of the environment we reach the thought of God.

Once naturalize God in human thought in this way, and it becomes possible to naturalize man in the kingdom of the Eternal.

That is what I meant by saying above that the newer way of looking at theism "supernaturalizes" man. Here we come to the future life by way of theism. It lifts man right up to eternal possibilities — gives him value for immortality — by making his very mental life, his organization of experience, his needs and struggles, themselves the very evidence and vehicle of the proof

of God. Disprove God, as I said, and man goes too; but prove God through man, reach belief in the greater through the less — then the less is taken up into the greater.

Picture to yourself the planetary system whirling on through space with no life on the worlds — no man, no conduct, no thought, no ideals, nothing but globes whirling on forever. Now in your own mind you cannot help passing judgment on this thought. You say to yourself: "Miserable business, unworthy of being made; if God be outside of it he must be ashamed of it: he cannot be inside of it; for it does nothing but whirl to all eternity." So you conclude that there could be no God anywhere in such a case. The possible experience — the perception of mere globes, simply whirling — could not be organized to mean a spiritual reality.

But now put man back again in the system — with his life, his ideals, his beliefs, his struggles — and the whirling becomes at once the most insignificant thing that is there; and all because you have reinstated the form of natural existence which we call moral and its experiences which find spiritual organization. God, you say, must be in that; and if that should utterly die out — that which gives spiritual meaning to the whole — this would destroy his presence also.

But all this is not an argument; it is rather an appeal to one's sense of the realities in the world, and to one's judgment of the values which attach to them.

## II. Moscow after the Coronation[1]

Moscow just now — and of course all Russia, too — is a fit subject for light reflection. Yesterday the papers contained a certain note so brief that its brevity was suggestive, considering the subject of it; a note to the effect that the crown jewels and "many golden objects" were escorted to the depot the afternoon before and placed with appropriate ceremony in a specially guarded train, to be conveyed to the winter palace in St. Petersburg. As a matter of fact, the crowd about the jewels was not large, as the carriages containing them, exposed to view, passed in front of my hotel, and everybody did obeisance with the evident lack of *qui vive* which follows "after the ball is over."

In fact, Moscow is weary of ceremony. Twenty million dollars worth of pageantry (so it is said) in three weeks — say a million-worth of royal spectacle a day! — must intoxicate a good deal; especially when the occasion is not of the character of a Roman holiday. The coronation ceremony is, in fact, a great religious fête in the calendar of the Greek Church. The intoxication therefore is more than half religious. Then add to this the fearful emotion of the calamity on the Khodinsky Plain,[2] and the measure of moral excitement aroused in these days of glory may be in a measure conceived. More than this, too! There is a certain exaltation of the national sense, due both to the complex Church-State character of the ceremonial, and to the superb testimo-

[1] From *The Open Court*, Aug. 20, 1896 (letter from Moscow). The reflections of this short paper serve to illustrate certain positions taken in that on "The Psychology of Religion" above.

[2] The fatal crush attending the distribution of royal gifts to the poor on May 18, 1896.

nials laid by foreign nations during this month at the feet of Russia. Of course, from an international point of view all this foreign tribute is only formal, and its meaning even in those cases — as that of France — in which it has a meaning, is purely politico-dramatic; but the people do not take an international point of view, least of all in this country. And it is clearly no light thing in the development of the Russian national sense that the coronation, coming but once in a generation, still has this complex popular significance. It is a stirring up of all that is most deeply sentimental in men of all classes: national exaltation in all, personal devotion to State and Czar in most, spiritual excitement akin to that of conversion and the religious trance in the enormous mass of that lowest class whose presence in the streets in Russian cities is like leprosy to a man clean of body, and whose presence in the country it is which makes it impossible — and will make it impossible for a long time — for Russia to have any other government than one of absolute paternalism.

These generalities suggest the line of reflection in which I wish to indulge for a little. Certainly to one from the Occident the most remarkable thing about Moscow now is its exhibition of religiosity. An excessive reaction of emotion seems to be expressing itself in the open churches. It may be that I am underestimating the ordinary vitality of the popular devotion; but it is impossible to conceive that the amount and kind of worship now showing itself here can be a symptom of the Church's normal hold upon its devotees. It is one thing for the passer-by, of whatever rank or caste, to doff his hat when passing through the Redeemer's Gate; and it is quite another thing for people of every rank to jostle each other in the churches for place in order to touch

the floor with their foreheads, or kiss superlatively repulsive relics of bone and hair, and to interrupt the traffic of the streets in order to do the same before the countless images exposed on every block of wall. And besides the matter of these devotions, there is the manner of them. I am entirely unable to write out my sense that there is a certain unconscious fulness, a sort of pressure for utterance, a vehemence and intolerance in these worshippers here now which I have never seen in any customary and usual religious rite. Rome shows relics, has prostrations, makes elevations; but one never sees anything in Rome that is not listless, official, and formal, compared with this. One would expect this in the celebration of masses — still going on — for the victims of the horrible catastrophe of May 18, and their families; and I have already said that so soul-stirring an event may be an element in this general popular religiosity. But that was, after all, but an incident, an interruption of the programme, whose subsequent numbers went right on. The current of events carried off the dead; and the public only feel the whole occasion more poignantly because this visitation of death served to make the whole time more remarkable.

However that may be, — whether this be the normal spiritual life of Moscow, the *Hauptstadt* of the Greek Church, or only a temporary reaction from the events of the coronation month, — it has in either case certain striking aspects. In the first place, the profound unintelligence of the whole Greek Church practice must strike one. It seems to have lost even those elements of protest and reform which we should expect in the Greek, as over against the Roman Church, from the reading of history. Image-worship could not be more developed than here in all its forms and vari-

eties. Especially do the people seem possessed with a sense of *idola fori* — to strain Bacon's phrase to a new use; gods of the market, the shop, and the highway. They make no discrimination, apparently, except that the Virgin seems to have the preference in number and size of jewels and weight of silver. They bow to an ecclesiastical equipage, cross themselves before a museum case containing a metropolitan's vestments, and doff their hats at a suggestion of church architecture — all this with the same devotion shown before the real hand of St. Paul, the drop of John the Baptist's blood, a fragment of cloth once worn by the Virgin, or the sacred oil from the box with which Mary anointed the Saviour's feet. This lack of discrimination simply represents a stage of culture, and may be connected with another striking characteristic, — the remarkable lack of æsthetic quality which the whole Greek *Religionsordnung* seems to show.

Lack of æsthetic refinement, of beauty, of form of any sort, seems to me to place this Greek cult very low in the scale of civilized religious practice. When the anthropology of religion comes to be written, there will be found, I think, a level at which the distinction made by the psychologists between "wonder" and "æsthetic reverence" will be recognized even in the externals of the religious life. The images, pictures, architectural adornments — all the media of appeal, so to speak — must be such that the religious sense at each stage of its development will find in it its fitting stimulus and satisfaction. At the period of Wonder, before the mind is able to think away from the symbol to the spiritual Presence, even the symbol may show the absence of those elements which constitute ideals at once æsthetic and religious. And we may find in the place of proportion, harmony,

meaning, simplicity, religious suggestiveness, only gaudy bulk, glittering jewelry, meaningless *Schein*. One must note this contrast here, and it becomes worse when its setting is also appreciated. The glittering gems on saint and virgin are often above the dirtiest of floors; the vows of the worshipper are uttered from the midst of indescribably filthy odors and fumes; the architecture is disfigured everywhere by crude and repellent brass and silver trappings, and uncouth paintings; no further use seems to be made of the really fine vocal effects sometimes produced by the choirs to which no one cares to listen; and no instruments, of course, aid the impression to the ear. As an extreme instance of the sort of violent incongruity which is possible, I may relate that the celebration of the mass in the Cathedral of the Assumption three days ago was not sufficient reason for putting a stop to the din of hammer and saw made by the workmen removing the platform on which the Czar had crowned himself just before the altar. What I mean is that none of the more refined effects of quiet, solitude, meditation, individual surrender to a great whole of religious influences — none of these things seem to be involved in the worship given before the blazing masses of gold, silver, and precious stones to which the people bow. Psychologically their condition must be one of "wonder;" I do not see how it can be one of æsthetic or spiritual feeling when the æsthetic is in every way so directly outraged.

There is another thing also which is remarkable to the novice in the comparative study of ecclesiastical practices, — as all students of such topics will see the present writer to be, — one thing which I have, however, a better right to note for its own sake. It is the union of royal with divine symbolism, and the psychological conditions which

such a union implies. I noted above the union of these two elements in the extreme case of the coronation ceremony. It may be seen in the very attitudes which the market-woman or the street-boy strikes when holding up the effigy of the Czar now on sale in the streets of Moscow. It is neither a question of patriotism in our Western sense of the term, nor a question of orthodoxy as the reformed theology defines it. It is much more primitive in its significance. It is, both with reference to the Church and to the Czar, a question of social sanity, a matter of existence in the environment which requires and allows no distinctions such as the statement of these questions implies. With eternal condemnation in the next life, banishment to the mines in this life goes very well; and it is the same joint authority which decrees them both. Why talk about severity or justice in the case of either?

Supposing this to be the real mental state of the lower class of Russians, what material it gives for the study of religious geology — to use a figure — material illustrating the lower and undifferentiated forms of human sentiment. It has often been said that evolution could be studied by means of the comparative investigation of peoples at different stages of culture, and something of it has been done; but I do not know that any one has suggested the study of the religious rites still alive, for light upon the development and differentiation of such sentiments as patriotism, social feeling, religious and ethical sentiment, from their common stock or stocks. It may be — to keep to the case before us — that both the "divine right of kings" and the "temporal power" of the Church have the same psychological justification, from an evolution point of view. The historical separation of Church and State may be looked upon as real

evidence and symptom of the dawning of higher refinement and discrimination in social values.[1] In other words, we do not have to resort to historical anthropology and the specimens of the ethnological museums for light upon the development of the human sentiments; we may study the different stages alive, so to speak, in the cults and rites of to-day. There are strata in the culture conditions of living religions, and the psychological anthropologist may theoretically put them together so that curves of progress of such sentiments as patriotism, religious awe, respect for woman, etc., may be plotted on a cross-section of the whole deposit — curves which intersect, flow together, or differentiate at definite depths and altitudes.

Of course such a science is difficult; but it has its safeguards. Anthropology, on the psychological side, is just now coming to the generalization that different races and stocks show the same mental constructions — *i. e.*, intellectual, sentimental, social, etc. — at parallel stages of their progress. Even philology is finding that homologies in roots and stems do not prove connections between languages, since language has in all cases the same psychology and the same vocal apparatus. The biologists are coming to a similar understanding in their principle of "determinate evolution," which perhaps has after all its ground in the mental factor in the ascent of life. This principle, which in the history of culture we may call that of "determinate moral evolution," serves as a constant test and check upon isolated lines of culture-history, — as that, say, of the religious development of the Russian peoples.

Of course I attach little importance to the observations made above on the rites, etc., seen in the churches

[1] *Cf.* the remarks on this subject made above, pp. 334 f.

in Moscow and elsewhere in Russia; it is summer, the coronation has just taken place, the aristocracy do not attend the daily public mass. But that again does no hurt to my general reflection. For a single people may show, in its different classes, several strata of culture; indeed, what else can caste distinctions be when looked at from an anthropological point of view? And we may have in a single civilization a recapitulation of culture-history, which, when spread out in time, would represent the toils and upheavals of many social epochs.

But — to return to Moscow — I cannot put down my pen without one more reflection, albeit of a less philosophical character. Yet it is philosophical in a sense! We are told by some that a people's culture and philosophy may be traced by means of the special development of their sense-perceptions. The idealists — the Greeks — are visual, eye-minded, their best sense is sight; the realists — the Scots — are tactual, they have a firm sense of resistance, they react best to things of contact; and so on. If this be so, it may serve my reflection to say that whatever the Russian culture be in its psychological roots, negatively one thing is safe — it is not *olfactory!* A Paris correspondent of a London journal recently wrote to his paper: "In Paris we have had a drought, a dreadful drought; and oh, where is the committee on smells!" No one can remain many days in Moscow without sighing for the same committee, and especially *à Moscow après le couronnement!*

## III. Mr. Spencer's Philosophy[1]

In speaking briefly of Mr. Spencer's psychology, perhaps I can do no better than throw the impressions which I have into the form of informal pros and cons. I should premise what I have to say, however, with the remark that one of my reasons for not accepting your kind invitation to be present and speak on this occasion, was that I could not just now find time to put in exact form such a detailed appreciation as the proper attitude toward so great a subject requires. Yet I feel unwilling to allow the occasion to pass without bringing a trifle of some kind to add to your fuller tribute to Mr. Spencer. I beg, therefore, that you will consider what I say as impressions left on my mind from the study of Mr. Spencer's volumes — my personal reaction to his work — rather than as a well-formed opinion which I should in any way wish to commend to others.

First, then, for the pros.

1. Of course, the great and evident service rendered by Mr. Spencer in the many departments of his labor, has been his deliberate and argued advocacy of evolution. In all the spheres of the application of evolution doctrine, there was a prejudice to overcome; in none, so much as in psychology. It is not overcome yet. Spencer's is today the name to refute, to pulverize, to anathematize, to ridicule, by the opposition which in Huxley's case spoke through the Bishop of Oxford, and which has used Spencer for its fulcrum ever since in raising the resistance with which science loads the other end of the lever. Fire a gun at the "First Principles," put to flight "feelings

[1] From *The American Naturalist*, June, 1897; letter written to the Philosophical Club of Bryn Mawr College, on the occasion of the celebration of the completion of Mr. Spencer's *Synthetic Philosophy*.

and representative feelings and re-representative feelings," — and the cosmos is safe. In all this Spencer has borne the brunt.[1] But all the while Herbart and Wundt and James — may the last-mentioned forgive me, but he more than others has ridden rough-shod over the pages of Spencer — have been getting the credit which they deserve for the coming of a naturalistic era in psychology.

In this matter of naturalism, our ship has had to change her course one hundred and eighty degrees; Spencer set the compass true in the new direction, and through all the buffetings, and breastings, and poundings, and creakings we are only just now getting her head to bear after his compass.

2. It is to me also a great thing that Mr. Spencer did not draw too sharp a line between biological and psychological evolution. All the talk about the boundary lines of science, the divisions of this *Gebiet* from that, this "point of view" here and that there — all this to the contrary, the objective science of mind is practically the great science after all. Of course, lots of qualifications are necessary here, and philosophers will demur, but I for one feel somewhat more secure when I have behind me the methods of objective science. Darwin's way of studying the emotions was more fruitful than that of his predecessors. Our knowledge of memory has been most advanced by research in pathology and brain localization. If once we discover pain-nerves, we refute a theory academic from the year one. Now the credit of taking this objective point of view generally and of so deliberately using biological data and even biological explanations

[1] It is a pity that he should also have to bear the brunt when the competent writers — such as Professor James Ward, in his *Naturalism and Agnosticism* — select his name to put upon certain of their "men of straw"!

belongs to Spencer. What is the use trying to complete a psychology simply as such? What is the good trying with Wundt to abstract "pure feeling" from "pure sensation" when really each is pure mythology? Is it not the defect of biology also that it tries too much to complete a biology merely as such, without the help of psychology? When two sciences are ripe enough to fall together and be one, that is good; and there is no earthly use in trying to keep them as far as possible apart in the meantime. In this, I think, Spencer was right. There is only one evolution, let us keep an eye on both sides of it.

3. As to Mr. Spencer's positive contributions to psychology, these I may not discuss in detail. They are mainly incidental to the ideas in the service of which his speculations were made. His theories have nearly all been disproved; I mean his particular theories. But his contributions by the way are of very great importance. And many of the disproved theories have been guiding-threads for thought and motives for research to countless workers. One cannot open a competent book in any of three or four great departments of thought, without finding the most fruitful discussions turning about the hypotheses of Spencer. I take it that this is one of the greatest scientific services of a great man — to lead others in definitely directed effort — even when his private views go down in the result.

And now for the cons.

Here what there is to say seems to me to be mainly a statement of the limitations incident to the very qualities which we have found to be Mr. Spencer's principal claim to our admiration. Every great idea seems in its first blush simpler than it is. Natural selection, for example, is proving itself by giving ground. But the fame of its

author, Darwin, does not suffer from that — even apart from the fact that Darwin was wiser than are his disciples! We are now saying "back to Darwin," and although we can never say "back to Spencer," yet Spencer has his place fixed for all that. The real limitations of Spencer are evident just in this contrast with Darwin.

1. Spencer's genetic Psychology was an idea, just as his genetic Biology and Sociology were ideas, and the same idea. But he could not prove this idea in all these departments. He could only see the evident and surface facts which his idea was likely to explain. This he did in a very remarkable way in the *System of Synthetic Philosophy*, the completion of which you are celebrating to-day. It is marvellous that a single mind should have been able to make so many happy hits in so rapid and, in a good sense, superficial survey of all these fields. But it was, I think, rather that he had a wonderfully fruitful idea than that he had a wonderfully great mind. He was armed with the thought which all the natural sciences are tending to prove true; but the same sciences are showing that almost all the ways in which he took this idea to work were not true. This means that Mr. Spencer's personal theories were in the direction of his gifts — toward a deductive, hypothetical, inexact way of treating scientific details.

2. Then as to his method, that too is a great limitation. It has always seemed to me that Mr. Spencer was a great example of the costliness of analogy. Analogy, analogy everywhere! It is not a part of the interconnection of the sciences that the facts of one should be explained by analogies from another; yet such a procedure Spencer constantly falls into. Chemical analogies in biology, biological analogies in psychology and sociology, mechanical analogies — integrations, dissolutions,

reintegrations — all the way through. In psychology this is especially deplorable, since it leads to a general tendency — also apparent in the sociology — to be satisfied with inadequate analysis; and inasmuch as the analogies are drawn from spheres of simpler activities, it is just the refinements which characterize the higher as higher that escape it. Everybody knows the flat sterility which results when the association theory is applied to the higher reaches of thought and conduct. It is like proving a bed of tulips to be mere onions by going through them and nipping off the tell-tale blooms. So to solve the problems of psychology by biological or chemical analogies, is to make use of a weapon which, figuratively speaking, nips off all the blooms! But this is only part of a greater limitation, to wit:

3. Mr. Spencer's view of evolution is not what we are coming to-day to consider the true thought of natural genesis. Herein is the real and essential limitation of Spencer's work considered from a philosophical point of view — and possibly I am departing from the topic of psychology in mentioning it. He believes, I think, that the new not only comes out of the old, but that it is explained by the full statement of the old. Now this is a philosophy; and it is a levelling-down philosophy — whatever we say to the question as to where it finally lands us. It tends to state the tulip in terms of its roots. Now this is the motive of science, but when it is made a philosophy and a presupposition to science, then it is baleful. For besides rendering it excessively difficult to be a good scientist — not to judge it as a philosophy — it makes the thinker liable to continual "illusions of simplicity" — thus to designate the fallacy of taking things to be too simple. So with Mr. Spencer's psychology: it impresses one as a series of great illusions of

simplicity. Many of his generalizations depend each upon just one striking fact of easy interpretation from his point of view. The "surplus energy theory" of play, the "dream theory" of spirit, the "dance theory," the "vocal theory." And many of the more important principles which are not of so easy an interpretation seem nevertheless to owe their place as corner stones in the system to this same tendency to simplification. Such are "utility" in ethics, "use inheritance" in biology, etc.

4. The same thing is seen in the ease with which difficult places are glossed over. A bridge of analogy or often of mere vagueness of expression covers a yawning gap, often at a most critical place. This, however, is so common a criticism of Mr. Spencer, that I need not take it further.

In conclusion I may say that the balance to the good in any fair estimate of Mr. Spencer's work is so enormous, that we should not hesitate to recognize as correct the verdict of all the world to the effect that he is one of the main factors in the main movement in the history of modern thought.

# XXI

## SHORTER LITERARY PAPERS

### I. Contemporary Philosophy in France[1]

M. Taine introduces his readers to the founder of modern French Spiritualism in his usual racy way. "One morning, in 1811, M. Royer-Collard, who had just been named Professor of Philosophy at the Sorbonne, was walking among the *quais*, with a very embarrassed air. He had been reading Condillac — but embrace Condillac! — believe and teach that all our ideas are transformed sensations, that space is perhaps an illusion! — these formulas exhaled a vapor of scepticism which was stifling to the fervent Christian, the austere moralist, the man of order and authority. But he was new in philosophy, he had no doctrine of his own, and, *bon gré mal gré*, he must possess himself of one. Suddenly he perceived, in the window of a second-hand book store, between a worn-out Crevier and an *Almanach des Cuisinières*, a strange little book, a modest, ancient denizen of the *quais*, whose leaves had never before been turned: *Inquiry into the Human Mind on the Principles of Common Sense*, by Thomas Reid. He opened the book, and lo, a refutation of Condillac! '*Combien ce livre?*' '*Trente sous.*' He bought it, and founded the new philosophy in France."

New philosophy then, it is the old philosophy now. New as a *nom de guerre* in the warfare with the sensa-

[1] From the *New Princeton Review*, III., 1887, pp. 337 f.

tionalism of the eighteenth century, old as the conservator of politics, literature, and morals in the middle of the nineteenth. For we now have a new "spiritualism," preserving, indeed, the traditions of the old, and claiming the same influence on the side of liberty and good order, but positing theses which would startle the good soul of Royer-Collard, and boasting no longer of its descent from Reid and Dugald Stewart. This descent, however, is very clear. If we may remodel the figure by which De Tocqueville indicates the evolution of later French literature, we may say that Reid begat a son in his old age and called his name Maine de Biran, that Maine de Biran lived twenty years and begat Victor Cousin, and that Victor Cousin, being a mighty man and strong, is begetting every day.

The characteristics of the old spiritualism are very marked. It was born of the exigencies of the post-revolution period, when thinking men sought first of all an antidote to Rousseau. Be it what and come whence it may, give us truth, liberty, God! "Was it then to play with him, O Nature, that thou didst form man? If this philosophy be that of human nature, do not enter, O my soul, into its secrets!" So cried Reid. Frenchmen had entered, by force; they added to the Scot's intuitive dread, a living experience of its horrors, and hailed "common sense" as the potent remedy. This is the first characteristic.

But the ontological spirit was abroad in Germany, and soon found its way across the Rhine. Maine de Biran discarded a descriptive psychology, but, preserving still the introspective method, saw absolute being in the soul, the essence of which is will. "The will is not different from the Ego."[1] The soul is efficient, and

[1] *Oeuvres*, iv., p. 180.

the will is its phenomenal manifestation. And the soul is one throughout and indivisible. Here is the restoration both of efficient and of final cause which were banished by the destructive criticism of the preceding age — a restoration which persists in the new Spiritualism and gives color even to the thought of the Positivists. When Victor Cousin went to Munich, in 1818, and surrendered his liberty to Hegel, he only made at a single step the advance from Biran, the Fichte of France, which his new master had made from the real Fichte, through the mediation of Schelling.

The "new spiritualism" is the product of what has been called the nineteenth-century tendency — the tendency toward the reconciliation of philosophy and science. The concessions have been greater on the side of philosophy, since more philosophers have become scientific than scientists philosophic. M. Paul Janet defines the university philosophy as it became official about 1830 as follows:[1]

"Do you admit God, the soul, liberty, the future life? Then you are a Spiritualist. If not, then not — *il n'y a pas de milieu*. The Positivist is in no sense a Spiritualist, neither indeed can be."

M. Vacherot, the historian of the "new spiritualism," speaks quite recently in a different key:[2]

"I do not believe that in the presence of these revelations (of science) it is possible to maintain the spiritualistic tradition entire. I am more and more convinced that the time is come to put science at the side of spiritualism, by the employment of its methods, its principles, and its incon-

[1] *Philosophie française contemporaine*, p. 40.
[2] *Le nouveau Spiritualisme* (1884).

testable conclusions. The old theology, which separates God from the world, has had its day, as the old physiology, which separates the soul from the body, and the old ontology, which separates spirit from matter." "Philosophy must bend to experience." "Spiritualism must bend to scientific methods."

What could the Positivists wish more? Where is metaphysic? If you mean the metaphysic of the noumenon, the metaphysic of the Unknowable, the Absolute, it is excluded, replies M. Vacherot. By what law? By the law of experience. But if you mean the metaphysic of intuition, the ontology of introspection, I embrace it. "The true ontology is only a psychological revelation." This is the method, principle, and conclusion of metaphysic, and positive science confirms it. This brings us back to the Scottish psychology, with the modifications of the later German realists; that is, we see in M. Vacherot on the speculative side, a true disciple, as he claims, of Cousin and Jouffroy, and on the positive side we find a wide concession to the claims of natural science.

As might be expected, this advance toward Comte is repudiated by thinkers of the old school, and many brilliant works have been called out in the discussion. M. Ravaisson, in the second edition of his *Philosophy in France in the Nineteenth Century*,[1] continues to maintain his "spiritualistic positivism" — namely, that "the true substance of things is the activity of thought." He finds his doctrine in Aristotle, and traces it through Descartes, Leibnitz, Kant, and Biran, especially emphasizing the position of the last. "Being," said Biran, "is immediately known in the activity of the ego," and, adds

[1] *La Philosophie en France au XIX Siècle* (1884).

Ravaisson, "this being, through the mediation of will, is universal, absolute, and all-embracing." He inverts the formula of the materialists, and thinks he has escaped its implications. But matter is spirit and spirit is divine, hence matter is divine, and we are as nearly materialists as spiritualists, because we are at once neither and both. M. Lachelier, in doctrine the disciple, but in power the master of Ravaisson, constructs a doctrine of the development of thought in the categories of efficient and final cause, which is at once profound and obscure. Efficient and final cause are one in the unity of thought, which unity is embodied in the law of sufficient reason, but two in the unity of nature. Final cause gives a *raison d'être* to external things, as efficient cause to internal, and by it we reach objectivity, activity, liberty. But we are constrained to ask wherein the difference consists between the two kinds of cause in respect to objectivity, if both are formal. How is final cause a road to things, even on the doubtful supposition that it is necessary to the unity of thought?

On this side of the general philosophic controversy we must also name Renouvier, whose critical system is better known to English students,[1] Francesque Bouillier,[2] one of the ablest defenders of the soul from the standpoint of general psychology, and the acute theologian Pressensé.[3]

Nearer to the position of the "new spiritualists" and yet maintaining full independence, we find a line of well-known scientific men whose detailed and comprehensive work has won glory for France. M. Cournot[4] main-

[1] See *Essais de Critiques générales.*
[2] *Sur la vrai Conscience* (1882).
[3] *A Study of Origins.* Eng. trans. 2d edition.
[4] *Materialisme, Vitalisme, Rationalisme* (1875).

tains a dynamic theory of matter, and a *nisus formativus* or architectonic principle of life, which is teleologic. M. Naudin, the distinguished botanist, takes arms against Darwin, disputes insensible modifications, natural selection, and variation of species, substituting an internal primordial plastic force for the external and mechanical causes of the naturalistic evolutionists, and rising through the theory of second causes to orthodox theism. Claude Bernard, in a series of articles published in one volume after his death,[1] combats all forms of physical vitalism, and works out a spiritualistic theory of life. His celebrated definition of life is often quoted: *La vie, c'est la mort* — a sentence which, according to Janet, caused Hegel to "shake with joy." Every phenomenon of life is accompanied with organic destruction; but life continues. This is creation. Death is chemical, life is morphological and directive.

On the extreme left we find the Positivists holding a strong position. They remember well the supremacy gained in 1852, when one of the chairs of philosophy in the Normal School was abolished because speculation was unpopular, and their rule of ten years, during which the spiritualistic tradition was barely preserved in Caro and Lemoine. They had also a season of rejoicing just after the Franco-Prussian war, when the Association movement was extended to France in translations of Spencer, Mill, and Bain, and gained influence in Taine's *Intelligence* and Ribot's *English Psychology*. A series of articles in the *Revue Scientifique* for 1874 expounded the work of Wundt and the German physiologists, and on January 1 — curiously enough the very day on which the British quarterly *Mind* appeared — the *Revue Philosophique* mailed its first issue. It would not be just to

[1] *La science expérimentale.* See, also, *La Vie* (1878).

call the philosophical position of either of these magazines "positive," but the position of Professor Ribot and many of his co-laborers justifies us in mentioning the *Revue Philosophique* at least among the influences which make for Positivism. Its most important contributions have been from Espinas, Charles Richet, Delbœuf, and the members of the medical school of the Saltpêtrière (Asylum for women), especially Charcot, the director.

There can be no doubt that the "positive" view of things is, as Lange maintains, stimulating to scientific endeavor and discovery, simply on the general principle that men work hardest along the lines of their belief. And as far as philosophy is made scientific, that is, empirical, this benefit accrues to philosophy also, while the domain of speculative reservation remains untouched. Psychology is the disputed province, and hence the rise of experimental psychology. It is an exotic, it is true, but it has taken firm root, and is now the most promising tree in the philosophic orchard of France.

Two events of importance have recently tended to dignify this departure and to make it official: one is the appointment of M. Ribot to a chair in Experimental Psychology at the Sorbonne, the first of the kind ever founded in France;[1] the other is the founding of the "Society for Physiological Psychology."

It is difficult to summarize results when activity is so great and discussion so warm, but we may indicate important works. M. H. Beaunis has the honor of making the first reliable experiments with view to establishing the reaction time for olfactory and gustatory sensations. He published his results in 1883, in the *Revue Médical de l'Est* and the *Revue Philosophique.*

[1] As it happens, M. Ribot has just now resigned (1902) and M. Pierre Janet has been named as his successor.

An account of his work will be found in his recent book, *Conditions of Cerebral Activity*,[1] etc. In the same work he treats of the forms of muscular contraction and arrest, and establishes, with the aid of the experiments of Wundt and Brown-Sequard, an important physiological principle, viz., that every manifestation of nervous activity undergoes an *arresting* influence which is due either to the original exciting cause or to the action of another nervous region. So that in every peripheral excitation two forces are set in play, positive or exciting, and negative or resting, and the resultant is the sensation energy of the excitation. If this is so, the excitability of the different regions of the nervous system depends upon the varying force of the arrest. M. Beaunis' psychological inferences are very interesting, and we transcribe them, only remarking that his physiological conception is founded upon established facts. He says:

"This hypothesis puts in new light the mechanism of the psychic functions, and permits the interpretation of a number of facts which have been heretofore inexplicable. . . . The central primal fact which rules the whole question is the duality seen at the basis of every psychic act, the double tendency, activity and its arrest — the fact that the psychic act is the result of two contrary movements. Transport the action of arrest into the domain of consciousness and you have the hesitation which accompanies a voluntary movement or an intellectual determination, into the sphere of emotion, you have the fluctuations of passion, into the sphere of pure speculation, the reserves of metaphysical doubt. All our intellectual life is a strife of tendencies, — impulsion and arrest."

[1] *Recherches expérimentales sur les Conditions de l'Activité célébrale*, etc. (1884).

We note below the bearing of the doctrine upon ethical discussion. M. Beaunis has also prepared another work, *Internal Sensations*, for the "International Scientific Series."

The best work in brain physiology has been done by Charcot[1] and Marique.[2] The latter investigates the functions of the psycho-motor centres of the brain, giving first a very exhaustive critical summary of the work of his predecessors, and attempts to show, by means of association fibres connecting the psycho-motor and sensory centres, that their combined function is identical with that of similar pairs in the reflex ganglionic centres of the spinal cord. His fundamental assumptions are that "consciousness does not alter the conditions," and that the motor centres are co-ordinators, and not, through the will, originators of movement, as Ferrier and spiritualists in general hold.

On the more varied problems of physiological psychology, we note M. Ribot's *Diseases of Memory, of Will* (1883), and of *Personality* (1885), the detailed work on hypnotism by Binet and Féré, Pierre Janet, and Charcot,[3] and the investigation of Delbœuf in psycho-physics.[4] A more general work on psychology, especially fine in its comprehensiveness and vigour for classroom work, is that of Professor Rabier,[5] of the Lycée Charlemagne, member of the Superior Council of Public Instruction. He writes from the standpoint of advanced spiritualism subordinating ontology to psychology, but with a receptive attitude toward the results of the empirical

[1] *Leçons sur les Localisations cérébrales* and numerous articles.

[2] *Recherches expér. sur le Mécanisme des Fonc. des Centres-psychomoteurs du Cerveau* (Hôpital St. Jean. Brussels, 1885).

[3] *Revue philosophique*, 1884–6.

[4] *Psychophysique* (1883). Also, *Examen critique de la Loi psychophysique*.

[5] *Leçons de Philosophie : I. Psychologie* (1884).

school. He borrows largely, and generally improves what he borrows, as, for example, Biran's theory of cause and Taine's theory of sense-perception. He attempts to reconcile empiricism and intellectualism in a doctrine which he denominates *intelligent empiricism:* knowledge is empirical; it begins with experience, but with internal experience, that is, with consciousness of the ego, which is intelligent. This is certainly, as Victor Brochard remarks, only a *jeu de mots*, and M. Rabier is an intuitionist after all. His book, as a whole, is perhaps the finest *résumé* of the results of modern psychology to date (1884).

Turning finally to the ethical discussion, we are at once struck with the brilliant play of the same forces. Ethical territory is the citadel of the spiritualistic philosophy, devoted once, it is true, to the completest destruction, but never again to be undermined by the sewer-canals of the burrowing sensualism of the Revolution period. No intelligent Frenchman cares to question now the political function of philosophy, nor the ethical function of politics. Ask De Tocqueville, Laboulaye, Janet, and Guizot for their opinion on this subject. Taine may follow Voltaire, and the mantle of the Encyclopedists may fall upon weaker thinkers of to-day, but they will find that they have a more dangerous enemy to meet than had their illustrious predecessors. The corner-stone of the new ethics was laid in the lurid light of the politics of the Reign of Terror and the Commune, and this corner-stone is a principle which rests deeper in the foundation of human life than the theology of Malebranche or the ethics of Leibnitz. What is the principle? Will, efficient, final, free, ultimate; the dominating idea, as we have seen, in general speculation, and the pivot of ethical discussion in France. To

show that this is true, it is only necessary to name the four works which are to-day, from the standpoints of the different schools, exerting the widest influence: *Theory of Morals*, Janet; *Sketch of an Ethic without Obligation nor Sanction*,[1] Guyau; *Liberty and Determinism*,[2] Fouillée; *The Ethical Principle*,[3] Secrétan. The authors of three of these are disciples, to a greater or less degree, of Biran, and M. Guyau's doctrine is important both as leading the opposition and as attempting the construction of a "positivist" ethics.

M. Paul Janet's work is well known in the recent English translation. The essay of M. Fouillée appeared first in 1872, giving rise to wide discussion, and is now entirely recast. It is a direct attempt to reconcile scientific determinism with personal liberty by the intercalation of mean terms, drawn respectively from the external or mechanistic — the *fortune physique* — and the internal or voluntary — the *fortune morale*. The contribution of Biran, as I have said, was the introduction of will-force into the primitive intellectual act. A sense of effort accompanies every intellectual movement, and the categories are more than forms — they are forms of a spontaneous activity, will. This bridges the Kantian chasm between the voluntary and the intellectual life. Upon this basis M. Fouillée constructs a doctrine of "idea-forces." Every idea has a volition-energy, necessary to itself. The intelligence is the vehicle of volition, and the sum of the ideas is at once the act of the willing self, — this on the side of the *morale*. But every idea is accompanied by a physical modification, and a consequent discharge of physical force. The

[1] *Esquisse d'une Morale sans Obligation ni Sanction* (1884).
[2] *La liberté et le Déterminisme* (1884).
[3] *La Principe de la Morale* (1884).

resultant of these forces is a sense manifestation, — this on the side of the *physique*. Hence a double play of forces, necessarily parallel, since functionally homologous, in one of which volition resides and in the other mechanism. The theoretical reconciliation is derived from the conception itself of "idea-force," and it is well to observe that the *idea of freedom* becomes a dominating influence in the play of those forces. The stronger the conviction of freedom, the stronger is its "idea-force," and the more real the freedom which it indicates. "Idea-force" is a contribution to ethical terminology, but the conception is familiar to those who know Herbart's *Mechanic of Mind*, and Wundt's theory of apperception. Another recent and very important work by M. Fouillée is his *Critique of Contemporary Ethical Systems*.[1]

M. Secrétan, on the other hand, assumes freedom as a postulate of the moral life. He constructs a social ethics upon an original obligation to act as part of a whole. "I recognize myself as a free element of a whole." Reason is a mode of will — another modification of Biran — and will, the individual, exists in immediate communion with Will, the Universal. We rise to positive religious life and communion. M. Guyau, on the other hand, represents the evolution ethics in France, substituting the expression "least pain" for Mr. Spencer's "least resistance," and banishing freedom, final cause, and obligation to law. Life is the moral end, and the struggle for existence the earnest of its attainment. We must also mention M. Caro, the historian of pessimism, who delightfully characterizes the complaint of those who are dissatisfied with the present order of

[1] *Critique des systèmes de morale contemporaines* (1883).

things, as a magnification of the *mal en moi* into the *mal en soi*.

## II. James' Principles of Psychology[1]

The fact that a recent issue of the *Revue Philosophique* mentioned this book as the "long-announced treatise of Professor James," indicates that interest in it is not confined to this continent. I think it is safe to say that no book on psychology, in any language, has been so eagerly waited for in this generation, and it is as safe to say that no other book on psychology has appeared in this generation in English that was as well worth waiting for.

The book is about half made up of review articles, in many cases, but not all, revised and brought down to the latest publications. One of its most striking features is its breadth of reference to other writers in all languages. It is undoubtedly one of the most appreciative books of the work of thinkers everywhere that we have in English. Professor James has also given his book additional value by incorporating, *in locis*, full quotations from the most available and weighty authorities. The result is a book from which a reader, not versed in the history of thought, may get a pretty fair conception of the problems and schools of modern philosophy, so far as such problems rest upon psychological or physiological data.

In point of style Professor James is an acknowledged

[1] *The Principles of Psychology*, by William James, Professor of Psychology in Harvard University. 2 vols., pp. xii, 689, and vi, 704. American Science Series, Advanced Course. New York: Henry Holt & Co., 1890.

From the *Educational Review*, April, 1891.

master, particularly as regards clearness, simplicity, and picturesque illustration. In this last respect he is surpassed, I think, by few writers on philosophical subjects now living.

In philosophizing, two distinct literary methods or general styles are available, "massive" and "perspective" styles. The massive style proceeds by a statement of one's position, with its modifications, all, as it were, in a single mass. It is involved and cumbersome, but painstaking and not misleading. The perspective style, on the contrary, proceeds by a receding series of propositions, each more or less distinct, and each so clear that it seems final. It need not be said that this style is attractive. It simplifies philosophical thought, brings out clear issues and pins the vague; but it is misleading, especially to the novice in philosophy.

Professor James' literary method possesses this "perspective" quality to an extraordinary degree. He is even more panoramic than Taine. But Professor James suffers from what we may call inverse perspective, — a quality which invites no end of adverse criticism of his views from men who ought to embrace him as an ally. By the phrase "inverse perspective," I mean that he states the novel and most radical side of his doctrine first, and magnifies his difference from current views; then his whole subsequent discussion tends to tone down and modify the earlier statement. The reader's first impression is one of alarm, then of less alarm, then of no alarm at all, but probably of self-congratulation that such an authority agrees with his own views after all. This is so important a consideration, that it is only just to our author to tell his general readers to read him with suspended judgment, not to do him the discredit of thinking they understand him from a single

page or a single chapter, and above all not to quote him without the extremest care that a counter quotation may not be possible.[1]

As to the method, Professor James advocates the positivist point of view of natural science, based both upon introspection and experiment, a method which late work has now fully justified. "This book, assuming that thoughts and feelings exist, and are vehicles of knowledge, thereupon contends that psychology, when she has ascertained the empirical correlation of various sorts of thoughts or feelings with definite conditions of the brain, can go no further — can go no further, that is, as a natural science. If she goes further she becomes metaphysical." (Preface.) That is, it is no longer *empirical* psychology. But Professor James' own treatment shows that interpretation is the essential need of the hour, even in empirical psychology. His greatest originality is not where he claims it — in the point of view. The present writer has advocated this point of view for several years, and half a dozen others could be named who have; but his originality is in his theoretical construction of data — in matters of interpretation.

In the same connection, under the phrase "psychologist's fallacy" (I., 196), Professor James emphasizes a point which in our day needs supreme emphasis. "The

[1] In this respect Professor James is to be compared only with Mr. Bradley. He speaks of Bradley's "subtle, witty, but decidedly long-winded critique of the association of ideals" (ii., 604). I would not think of applying "long-winded" to Professor James; but neither is it just to Mr. Bradley. It might be said that they are both consummate masters of what I have called a "perspective" literary method. (The criticism made above may now, 1902, be extended to Professor James' later publications, *The Will to Believe* and *Philosophical Conceptions and Practical Results*. Each of these has stimulated various "interpretations" of the author's meaning, which Professor James in turn vigorously repudiates. It is no doubt in part due to this writer's independent and at times capricious use of terms.)

*great* snare of the psychologist is the *confusion of his own standpoint with that of the mental fact* about which he is making his report". . . . "he himself, knowing an object in *his* way, gets easily led to suppose that the thought which is *of* it, knows it in the same way in which he knows it, although this is often very far from being the case." This is the very bane of current speculative idealism, as far as its treatment of psychology goes. It reads into the child the speculative essentials of mind — self-activity, timeless identity, community with an absolute self-identical consciousness, etc. The first thoughts of a child are aware of the objects and of nothing else. But the psychologist, in looking at it, sees the "thought's object, plus the thought itself, plus, possibly, all the rest of the world. We must avoid substituting what we know (suppose) the consciousness *is* for what it is a consciousness of." So important is this warning of Professor James that I would not hesitate to devote all my space to sounding it out. Take this from Green: "A consciousness by the man of himself must be taken to go along with the perceptive act itself. Not less than this, indeed, can be involved in any act that is to be the beginning of knowledge at all. It is the minimum of possible thought or intelligence." On this assumption of the Greens and the Cairds and the Morrises, Professor James is not a whit too severe in this remark: "This is a perfectly wanton assumption, and not the faintest shadow of reason exists for supposing it true. As well might I contend that I cannot dream without dreaming that I dream, swear without swearing that I swear, etc., as maintain that I cannot know without knowing that I know"[1] (I., 274). Unity

[1] A good example of this fallacy in current discussion is the following damaging (?) charge which Professor Watson brings against Mr. Spen-

of treatment might have been brought into Professor James' account of "thought" if he had generalized the essentials of his theory in some such conception as that denoted nowadays by the word "apperception." I venture to think, subject to correction, that all of the author's theories concerning "knowledge about" a thing, as contrasted with mere "acquaintance with" a thing, are covered by the current conception of apperception. But before pressing this view, let us get hold, as clearly as we can, of his view of knowledge in general.

According to Professor James' way of thinking, what we have in consciousness is a stream flowing in time, — and empirical description of consciousness must begin with this stream, not with simple hypothetical sensations. This stream may be called, indiscriminately, Feeling or Thought,[1] for there is no valid distinction between them. Feeling is immediately cognitive, *i. e.*, it has an object which it knows. What we are conscious of at any moment is a segment of this stream, a cut through it, so to speak, and this is our unit of division of the stream into parts. Each such conscious segment or cut is a Feeling or Thought of an object. This object may be a single simple thing,[2] in which case the segment is a sensation, and knows the thing by "acquaintance," or it may be

cer, *i. e.*, that he makes "the occurrence of a sensation the same thing as the consciousness of that occurrence." *Mind*, lx., p. 543. Professor Watson reads into the consciousness of a sensation the knowledge (apperception) of it as a sensation.

[1] In what follows I attempt to state briefly and plainly the common idea which runs through the chapters on "The Stream of Thought," "Conception," "Discrimination and Comparison," "Sensation" "Association," "The Perception of Things" ("Feeling or thought" turns out after all to be merely loose terminology. See below).

[2] But the thing or object itself may be a relation; that is, there are direct feelings of relation (i., 245–248).

of different related external things or events, in which case it still has only a single object, the entire complex experience, but the Feeling or Thought is now a perception, conception, etc.; its knowledge is "knowledge about" the thing or things. Knowledge *about* a thing is knowledge of its relations. Acquaintance with it is limitation to the bare impression which it makes" (I., 259; II., 77). Following him I shall use the words Thought and Feeling simply for such a segment of the stream.

Now the present Thought may have as its object other Thoughts or segments of the stream, *i.e.*, it may know the past, and this is memory — the fact that a present Thought may know (cognize, feel) what has gone before in the same stream. The rule by which the exact segment of the past to be thus known is determined, is association, which is reduced to the single principle of contiguity. The reason that it is my own past that my present Thought knows (remembers) and no one's else past, we cannot say, except that my own past has a feeling of *warmth* (familiarity) to me, which no one's else past has to me, and by which I reach *self*-consciousness. "Remembrance is like direct Feeling; its object is suffused with a warmth and intimacy to which no object of mere conception ever attains. So sure as this present is me, is mine, so sure is anything else that comes with the same warmth and intimacy, and immediacy, me and mine" (I., 239).

Further, in the stream of Thought there are nodal points, so to speak; points of emphasis (attention) "substantive Thoughts," and between these points of prominence there are transition portions, "transitive Thoughts," unattended to (I., 243). But there are no absolute divisions in the normal conscious life; that is, we are conscious of no breaks. When there are breaks,

the two ends of the stream grow together vitally again. "Within each personal consciousness, Thought is sensibly continuous." "Even where there is a time-gap, the consciousness after it feels as if it belonged with the consciousness before it, as another part of the same self" (I., 237). To expect this consciousness, to feel the interruptions of its objective continuity as gaps, would be like expecting the eye to feel a gap of silence because it does not hear (I., 238). Transitive connections can always be found between substantive Thoughts; vague relationships by which the present Thought retains the tradition of the past. The stream of Thought is therefore continuous. There are no psychical atoms. In this supposition the associationist psychology makes itself ridiculous. "A permanently existing 'idea' or '*Vorstellung*,' which makes its appearance before the footlights of consciousness at periodical intervals, is as mythological an entity as the Jack of Spades" (I., 236). Every such so-called "atom" has a "fringe" of transitive connections; it is prominent and vivid; its fringe is pale and washed-out. But in every case it has a fringe. The simplest Feeling has a ragged edge, and this ragged edge links on to the ragged edges of other feelings higher up the stream and lower down (I., 255). The present Thought, therefore, is enriched by all the past experience of the individual, and the future Thought will be further enriched by what it inherits from the present.

In passing down the stream, Thought undergoes changes. The transitive may become substantive, and the reverse. The fringe may shine out in relief and the former object sink into dim suggestion only of feeling. These modifications in arrangement and disposition of the objects of Thought are due to the mental operations of "discrimination" and "comparison," of which no

more can be said than that they are irreducible and fundamental characteristics of Thought.

Again, Thought is selective. Only a slight portion of one's past is held and utilized in the present. Our individual worlds are different, because by progressive selections we have built up our experiences differently. Perhaps nowhere else in psychological literature is the essential selective function of Thought so well developed and so richly illustrated as here.[1]

The first peculiarity of this general conception is its use of terms. Feeling equals Thought, Feeling or Thought knows, Thought knows the past, etc. Does not this look like a subversion of the safest distinctions of current psychology? It does, indeed. But when we come to study the case more closely, we find it less revolutionary than it looks. We find that Professor James admits states of pure feeling in the ordinary sense, states which lack all "knowledge about," or relational quality. "In a new-born brain, this (strong sense stimulation) gives rise to an absolutely pure sensation" (II., 8; I., 272). Now whether or not we admit that such a state is cognitive, that is, is knowledge at all, the distinction is yet recognized between states purely or mainly affective, and states which involve relational construction through discrimination and comparison. And I think Professor James is asking too much of us in requiring that we give up one of the few exact distinctions in terminology which descriptive psychology can boast, while at the same time he preserves the distinction in fact, and has no good terms to substitute for the traditional ones. Perhaps when he

[1] I have purposely left out of account the conception of the nervous basis of the Thought-stream worked out by the author.

comes to treat of pleasure and pain he will give its usual meaning to the term feeling.

As a matter of conscious fact, I think the feeling of *what is going on* is distinct from the feeling of the object of ordinary sensation; and even when the former feeling is made object by introspection, there is an element of *feeling of introspection* in addition to the feeling thus observed. Accordingly the present segment of the stream has two elements: first, the Thought of the object made up (say) of a present thing and the tradition about it derived from experience; and second, the feeling due to the cognition of this object. This latter feeling is not *of* or about anything. For example, I see a very brilliant light (Thought) and it gives me pain (Feeling). We cannot say that the pain cognizes the light. Professor James would say, I suppose, that the Feeling of the light cognizes the light. But by Feeling he would mean the whole present segment, failing to discriminate between the feeling proper and the knowledge that there is an object and that it is a light. Even though we be as positivist as possible in denying any process more than Feeling, we still have a difference between. Feeling which refers outward, or backward, or forward, and feeling which has no such reference.[1] So if, instead of using Feeling for the whole present segment of the stream, we restrict it to that portion of the segment which is not cognitive, and give the word knowledge to that portion which is cognitive, we have the ordinary distinction between affective and presentative states. That is, we have a right to take Professor

[1] We might ask Professor James what the object is of the feeling of *warmth* spoken of above — say the first such feeling before the ego-idea is developed. To say its object is the ego, as the author intimates in i., 242, is the "psychologist's fallacy" again.

James seriously in this quotation: "What we are only acquainted with is *only present* to our minds . . . but when we know about it, we do more than merely have it. . . . The words, feeling and thought, give voice to this antithesis" (I., 222).

The next position is this: wherever there is an object, we find a "fringe" (I., 258, note), *i.e.*, vague felt relations which environ the object. From this we must conclude that wherever there is an object, there is more or less "knowledge about" it. In other words, there is no pure "acquaintance," and knowledge has to do, after all, only with relations. I would say that this comes very near to the doctrine of relativity, if Professor James did not go to great pains to refute relativity (II., 900). It is not fair to him, however, to construe him in this bald way, for he holds that such relations are felt, and although we may not follow him in holding that relations are only felt, still I think he proves his point that they are at least felt. But on his meaning of the word felt, the relations involved in "knowledge about" fall in the same category, and again, we have knowledge confined to relations.

Intrinsically, here again the ordinary distinction between feeling and knowledge is valuable, I think, and should be preserved. Admitting with Spencer and James that we have feelings of relation, still such feeling is a very different thing from knowledge. The same knowledge about a thing may arouse very different feelings in different circumstances. As Professor James shows, feelings of relation may be present when the actual relation is not. It is probable that at first a feeling of relation is not a feeling of that relation or *of* anything whatever; and it is only after a child has got knowledge *about* the objects of its experience that it

learns to attach the feelings to the relations themselves, and so the feelings become feelings of relation. To say the child has feelings of relation at the start is to be guilty of the "psychologist's fallacy." In short, such feelings were at first part of the affective portion of the stream, and they came to belong to the cognitive portion only because both the feeling and the relation are held together as part of a possible object of later segments of the stream.

But to proceed: the present state is a unit state, an undivided state; its object is its whole content. "The *object* of your thought is really its entire content or deliverance, nothing more nor less" (I., 275). It inherits past states, it mirrors (knows) them, but it unifies them. It is an integration of its present external object with the past of the same person. And this integration is accomplished through discrimination, comparison, and selection in several stages of generality, giving perceptions, conceptions, reasoning, etc.

We are now able to revert to a point already alluded to above. The question arises: Wherein does this conception differ from that of the apperceptionists? Here is a pulse of Thought whose content is a unit object, due to the integration of earlier with new elements of content; this object always involves relations, and these relations are brought out by the attention. Further, this pulse may be called perception, conception, reasoning, — according to the degree in which its integration bears away from concrete present experience. In other words: "This sort of *bringing of things together into the object of a single judgment*, is of course essential to all thinking. The things are conjoined *in* the Thought — the thinking them is thinking them together. This sort of *subjective synthesis*, essential to knowledge as

such, is involved in Thought's mere existence" (I., 331–332).[1]

With this I venture to compare my own definition of apperception, in which the same "essential" act of mind is singled out: "Apperception is that activity of synthesis by which mental data of every kind (sensations, percepts, concepts) are constructed into higher forms of relation." "It is the essential mental act in perception, conception, judgment." "The phrase apperception singles out that act of mind which is common to them all — the relating activity of attention, — and thus by its general application emphasizes the unity of the intellectual function as a whole." "Whenever by an act of attention mental data are unified into a related whole, this is an act of apperception." And "in its discriminating, selecting, and relating results, the concentration of attention is called apperception."[2]

Setting aside all philosophical implications, I see no difference in these two accounts except that my own statements have a little more of the atomism to which Professor James strenuously objects. But even this difference is due to difference in method. He approaches the subject analytically and the apperceptionists approach it synthetically.

I have developed this point at some length because it serves as introduction to a broader topic. The philosophical implications spoken of are the important feature of such a treatise, both for general readers and for the teaching profession; and while we recognize Professor

[1] Professor James' more developed view may now (1902) be seen in his President's Address "The Knowing of Things Together" in *Psycholog. Review*, March, 1895.

[2] *Handbook of Psychology: Senses and Intellect.* 2nd edition, pp. 65, 66, and 79.

James' right to shut out such considerations, and while we acknowledge fully the advantage to psychology from doing so, yet, in the words of our author, "of course such a point of view is anything but ultimate. Men must keep thinking; the data assumed by psychology, just like those assumed by physics and the other natural sciences, must some time be overhauled. The effort to overhaul them clearly and thoroughly is metaphysics."[1] So we may well ask the question: when Professor James does "overhaul" the rich mass of data here presented, what will be the outcome for general philosophy?

It is in view of this question of the theory of the mind as arising out of empirical psychology, that the conception of "apperception" is important. It enables us to "pool our issues," so to speak, as no other conception does. The associationists have pooled theirs; and if the believers in mental activity really wish to make a sharp and clear issue on the basis of facts, it is time they came to some mutual understanding and ceased firing into the ranks of their own army. Associationists will never be convinced by the idealism which disdains the patient interpretation of facts, nor will spiritualists ever be convinced by the bold assumptions and crude philistinism of the kind of physiologizing now asserting itself in the name of psychology in certain educational circles in America. But when it is possible for Wundt to defend a cause — apperception — theory of mind with no neglect of the data of physiology, and for Münsterburg to join issue with him in favor of the effect — associative — theory with equal fairness to the psychological data, and then for James to write an exposition of them both in the same spirit, we feel that truth is going to be furthered and applied.

[1] *Op. cit.*, Preface.

Now, with this issue thus "pooled" clearly before us, let us inquire into the meaning of Professor James' book.

What we have in consciousness is only a segment of what seems to be a stream. But this seeming cannot really be justified from consciousness itself. What seems to be "upward" in the stream is only that part of the present segment which has a peculiar "warmth" or coloring. Really it is all present in the pulse of Thought which is now; and the present pulse of Thought is absolutely all I have.[1] If this be true, it may be asked what guarantee have I that I have a past? —that there is an I that has experienced the past and is experiencing the present? What view of the ego does this doctrine of the present Thought lend itself to?

Professor James considers this question in his chapter on "The Consciousness of Self," — a remarkable and valuable analysis of the self notion.[2] The doctrine which results is briefly this: self is a very complex notion built up from the experiences of "warmth, and intimacy, and felt continuity" (I., 334), which are handed down from Thought to Thought, becoming more abstract as it is thus made matter of inheritance (I., 333–334). The kind of experiences which have this peculiar "warmth," are those primarily which centre

[1] When Professor James says we know the past (i., 688, note), he comes dangerously near to the "psychologist's fallacy." He means that certain experiences *now present* come to be object of the present Thought in a peculiar way, and this peculiar way, we learn, means the past. I think the author himself says somewhere that the child does not distinguish at first between present objects and memories.

[2] This chapter and the chapters on "The Stream of Thought" and "Will" are in my view the ablest and most significant in the book (together with the last chapter on "Necessary Truths," in which the author shows himself an early and able opponent of the Lamarckian theory of the "inheritance of acquired character," now, 1902, so generally discredited.)

around interest and activity; that is, around the voluntary life (I., 298). In its last analysis the notion of self is the notion of an intimate activity or agency which has become very "warm" through repeated emphasis. The element of activity, when carrying this warmth of personal identity (I., 336) is the feeling of self. Two further questions, therefore, arise: is there a direct feeling of activity (I., 298), a pulse feeling, a fiat of will; and is the feeling of "warmth" which attaches to this activity any guarantee that there is a spiritual agent whose life in time reveals itself to consciousness as a pulse of present Thought? The latter question the author dismisses as too metaphysical to be discussed in a work on positive psychology, the former he wrestles with in his chapter on "Will."

In reference to will, the author maintains that the effect-theory holds for involuntary attention, and for so-called "feelings of innervation" in voluntary muscular movement, but that over and above these, there is consciousness of a mental *fiat* or consent which cannot be put in the effect-category. It is the kernel of our feeling of self, and, considered strictly from the psychological point of view, it remains, as yet, irreducible. But whether consciousness is to be considered, consequently, a *vera causa* in nature — this again is too metaphysical a question. In short — by interpretation — this activity-feeling belongs to the affective portion of the stream of Thought, not to the cognitive portion. It is one of those original data which does not come from or by an object. It is the ground of mere acquaintance with self, in the nominative case, *I*, as opposed to what I know about self, in the objective case, *me*.

On this ground, our author takes up the current doctrines of the mental principle; and first the spiritu-

alistic theory. He states his own position of best advantage in reference to it in I., 339–340; and to this he opposes an exposition of the spiritual theory (I., 343). It is only necessary to compare the two expositions to convince us that Professor James is again finding too great a difference between his own position and what is essential to critical spiritualism. To be sure, he puts the statement of the soul theory in the mouth of "common sense," and so no one need defend it who is not prepared to take his conception from the philosophical amateur. But still it is unnecessary to charge all who call themselves "spiritualists" with the formalism of Wolf and the dogmatism of Berkeley. Indeed, the author realizes the true position of present-day spiritualism in what he says of it a page or two later (I., 345). Let us then repudiate with him, but still in the name of spiritualism, such formulas as these: "By the soul-substance is always meant something *behind* the present Thought"; "the spiritualistic formulation says that the brain processes knock the thought, so to speak, out of a Soul which stands there to receive their influence" (I., 345). We do not want a better statement of the claim of modern spiritualism than he himself gives us in I., 346–347.

But more positively, let us see what kind of a substance we are able to gather from Professor James' determinations in reference to the present Thought. To sum them up, the present Thought is a spiritual (thinking) presence, which is all that preceding pulses were, and it has a selective spontaneity of its own (I., 212). Of the three ordinary requirements of "common sense" substance, being, permanence, and potency (activity), the only one which the author leaves in any doubt is the second, *i. e.*, *permanence*. "The

Thought is a perishing . . . thing. Its successors may continuously succeed to it, resemble it, appropriate it, but they *are* not it" (I., 345).

Now admitting that for psychology time is made up of a series of "nows," that the "now" is all I have to guarantee my present being, it is still hard to tell just what the now is entitled to include. Professor James rejects the association atomistic hypothesis of a series of detached states most emphatically. His doctrine of "transitive thoughts" and fringe militates against the construction of the successive "pulses" in any atomistic way. And "the sensible present has duration." How much of the stream, therefore, does a single pulse mean? The nearest that the author comes to an explicit answer to this question is found in his discussion of the experimental determination of the area (lengthwise or *time*-wise) of consciousness for successive sounds. Here he finds "twelve seconds to be the *maximum filled duration* of which we can be both *distinctly and immediately* aware" (I., 613).[1] This is the "now," the "specious present." But there is no break between this now and the next now; on the contrary, there is a consciousness of the transition from "then" to "now." Even though we artificially mark off the periods, we feel the *relation* of difference between them, and then bind them together by another "now," which inherits them both. So, however the appropriation of the "then" and the "now" by a new "now" may be accounted for, each of these Feelings has had duration. That is, the pulse, the attention, the apperceptive act, by which the then and the now are integrated in a new now,

[1] I have elsewhere (*cf.* my *Senses and Intellect*, pp. 185–186) criticised the author's figures here; the maximum time is three to four seconds, instead of twelve.

occupies a distinct portion of time. So it seems that for this length of time, at least, the stream of thought is not a stream, but a frozen block. It stands still. If a Thought pulse may legitimately claim as its own, in the sense of absolute ownership or identity of nature, the contents of the stream two seconds back, it is difficult to see why it may not own, by an equally personal right, the "warm" experiences which lie still further back, especially when we remember this additional back-experience was "interfringed," by the same personal ownership, with what is so claimed.[1] If figures should represent seconds, and square links "pulses," the links would overlap — and guarantee duration to the Thought.

But leaving this, have we not in the doctrine of "appropriation" or "inheritance" of Thought by Thought, all the permanence that a modest spiritualism requires? Confessedly the "then" comes over into the "now": all that my past actually was, my present is, whatever worth it had is available now. To argue for a permanence that does not "tell" in any way upon the phenomenal series, is to waste breath; but if it does so "tell," in any way, this "telling" is, in Professor James' view, a permanent acquisition. I am now, therefore, all I have been, and more. Certainly, psychology seems to reach her limit in asking how this can be so; but if she should press the inquiry, the answer would have to be — either by reason of the brain, or by reason of a spiritual principle. But the former alternative Professor James expressly rejects in his chapter on the "Mind-Stuff Theory."[2]

[1] This is rather a difficulty of my own than a well-thought-out criticism of Professor James. Theoretically, his conception seems to me tenable, but I am unable to fit the movements of attention into it.

[2] The outcome of that chapter should be carefully weighed in the present connection.

I do not say that Professor James declares for spiritualism; that would be to say that he deserts the standpoint of his book. But what I claim is that from his conception — when rid of expressions which are unnecessarily hostile to the spiritual hypothesis — his conception of the stream of Thought should bring comfort to spiritualists and confusion to their enemies. And the comfort becomes positive satisfaction when one reads his final chapter on "Necessary Truths and the Effects of Experience." Here he argues trenchantly against the "experience hypothesis," finds race experience also inadequate, and finally puts into his "pulse of Thought" a cargo of rational principles. It is to be hoped that Professor James may some day write us a "Metaphysics"!

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